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A PROPOSED LOGISTICS STRATEGY
FOR
THE DEFENSE OF REPUBLIC OF KOREA

by

Ha Chul Soo

June 1984

Thesis Advisor: M. G. Sovereign

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A Proposed Logistics Strategy For The Defense Of Republic Of Korea

by

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Major, Republic of Korea Army
B.S., Korea Military Academy, 1976

Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis deals with concepts of strategy and logistics in the military and business fields. In particular, it is concerned with the relationships between military strategy and logistics. It recommends a logistics strategy for the defense of the Republic of Korea. Traditionally, the logistics has been treated as secondary. But, in current situations, attention must be placed on logistics. Four steps are needed by the ROK military forces in the long-term point of view. First, the commanders or planners of the ROK military forces should understand the concepts and true meanings of logistics for defense policy. Second, the ROK military forces should have an organization which can deal with the logistics support of the U.S. or allied countries in case of the threats or hostilities by the North Korea. Third, life-cycle costing methods should be considered as an acquisition strategy. Fourth, the weapons procurement process needs some change, especially in the middleman agencies.

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I. INTRODUCTION

In analyzing any subject, it may be desirable to reduce it to simple terms and to show them in logical relationships. In attempting to do this, it is inevitable that statements will be made which appear obvious or trite and even repetitious to those who are experienced in the specific subject. If we are to properly communicate our thoughts on strategy and logistics, and we propose to manage it as a part of any organization (military, government, business firm), then we ought to agree on some basic understanding of the concept.

Considerable time and effort have been devoted toward the development of credible strategic and tactical doctrines to defend our national interests. Various strategies are continually under review to find better methods of projecting military power. But through this process logistics has long been relegated to a category of secondary importance. In many cases, the crucial logistical implications of current strategies and tactics are not even addressed, much less investigated and resolved. A review of historical and current logistical realities, and their impacts on strategy and tactics will reinforce the critical necessity for us to examine logistical implications early in any strategic or tactical considerations or planning.

This thesis research is based on secondary data, i.e., based on published definitions and explanations of the concept of strategy and logistics, and the relationships between them. The purpose of this thesis research is to study the concept of strategy/strategic management and logistics/logistics management of both of the military and business fields, and to investigate the relationships

between military strategy and logistics, and finally to recommend a logistics strategy for the defense of the Republic Of Korea (ROK).

Chapter two deals with the origin of the strategy and its concept of both military and business fields. It also describes the strategic management, strategic decision process, and perspectives of the strategic management of business fields.

Chapter three concerns with the origin of the word "logistics", the concept of military and business logistics separately, and with the integrated logistics support (ILS).

Chapter four describes the relationships between logistics and strategy of military fields, and logistics impacts on strategy and tactics.

Chapter five recommends some logistics strategy for the defense of the ROK after investigating the relationships between the U.S. and ROK, realities on Korean Peninsula, and the U.S. defense strategy in relation to ROK and its allies.

The author gratefully acknowledges the direction and guidance of his adviser, Professor M. G. Sovereign, and his second reader, Professor Roger Evered in completing this thesis. In particular, the author is very grateful to the colleagues and others for their helpful advice, criticisms, and encouragement.

II. STRATEGY AND STRATEGIC MANAGEMENT

A. THE CONCEPT OF STRATEGY

Recently, interest in strategic management has grown rapidly in the fields of business and military. This interest in the topic reflects its importance despite the conceptual confusion asscciated with the concept of strategy.[1]

Roger Evered[2] emphasized the importance of the concept of strategy by the following sentences ;

> The concept of strategy is central to the policy and managerial sciences. The quality of policy research will be influenced significantly by the care we take with conceptual clarity, particularly with regard to the praxies of strategic management. The rush to quantify and to apply advanced statistical inference techniques is not likely to prove fruitful for the field of strategic management, unless prior care is taken with the concepts, constructs and theoretical orientation [Ref. 1].

Significant literatures on the concept of strategy have been developed in a number of fields, mostly in the fields of business management and military practice. However, the existing management literature on strategy is confusing because of the diversity of its meanings [Ref. 1]. More specifically, alternative meanings are;

(1). efficient task execution, (2). methods for achieving objectives, (3). overall mission, (4). a system of ends-means relationships, (5). the process of selecting

---

[1]Most of the concept of strategy are from the article [Ref. 1].

[2]Roger Evered is a Professor of management in the Administrative Science Department of the Naval Postgraduate School at Monterey, California.

objectives and missions, (6). the act of appreciating the environment, (7). our core existential choices [Ref. 2].

1. The Origin of the Concept of Strategy

Most words have a unique origin, and strategy is not exception. The word strategy comes to us from the Greek word "Strategos", which means a general in command of an army (strategos, army + agein, to lead).[3] Most early Greek states after 550 BC had a "strategos", or general officer of the army. Originally, he was a military official, but later acquired increasing administrative, civil and political functions, to become an important state officer. In 500 BC a "strategia", or board of 10 generals was set up in Athens, as a way of coordinating 10 tribal units and diffusing power. The 10 "strategos" that made up the "strategia" board were for several hundred years essentially the governors or CEOs of a region. The "strategia" was not, however, a board in the modern sense; there was no collective responsibility and no unanimous policy. From 509 BC to 490 BC, Athens confronted a wide spread revolutionary atmosphere, a crisis of the form of governance (democracy vs rule by council vs rule by strong aristocrats), and a crisis of foreign policy (relations with Persia, Sparta and Ionia). During the 5th century BC, the powers of "strategia" were considerably increased by political functions, especially in foreign affairs. The chief of "strategia" was at once the commander of the Army, the head of the state, the president of the federal assemblies and foreign minister [Ref. 1].

The evolution of the idea of strategy was ;

> Strategos refered to a role (a general in command of an army). Later it came to mean 'the art of the general', which is to say the psycholgical and behavioral skills

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[3]See Webster's New World Dictionary, Collins World Publishing Company, PP. 424, 1974.

with which he occupied the role. By the time of Pericles (450 BC) it came to mean managerial skill (administration, leadership, oration, power). And by Alexander's time (330 BC) it referred to the skill of employing forces to overcome opposition, and to create a unified system of global governance. Pericles provides a fine example of strategy in the political and the state management sense, and Alexander provides the ultimate example of strategy in the military sense [Ref. 1].

It is meaningful to compare the situations between Greek and current situations whether it is of business or military. The Greek states are analogous to corporations that organize themselves in a variety of ways, that compete, that form coalitions, that must deal with massive environmental threats (Persian invasions) and opportunities (creating a unified world) [Ref. 1].

2. The Concept of Strategy in Military Field

The history of military strategy is long, and it has been written by numerous authors and strategists. Roger Evered stated that the first recorded statement on military strategy is that by Sun Tzu, written in China around 360 BC, and now entitled, "The Art of War"[4] [Ref. 1].

Despite the scope of the military strategy literature there is still no agreed definition of the precise meaning of the term strategy (as in the corporate field). The term strategy first gained currency in Europe during the time of the Napoleonic wars. Prior to this time the term "strategem" was used (since about AD 1500) to denote a trick by a general designed to outwit or surprise an enemy. After the Napoleonic period, strategy referred to the art of projecting and directing the extensive military operations of campaign, which might be a sequence of battles. Clausewitz[5] defines strategy in this post - Napoleonic sense

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[4]Tzu, Sun, The Art of War, Oxford (1963).

[5]E. M. Earle, Makers of Modern Strategy, Princeton (1944).

; Strategy is the art of the employment of battles to gain the objective of war. In other words, strategy forms the plan of the war, makes out the proposed courses of the different campaigns which compose the war, and results in the battles to be fought in each. Clausewitz devotes much of his writings to arguing that war is both a social and political act, but also a real political instrument, a continuation of policy carried out by other means . For Clausewitz, the aim of strategy is the destruction of the enemy forces on the battle fields [Ref. 1].

With the growing complexity and interconnectedness of societies, technology and warfare, nations found it necessary to manage their policies through political, economic, technological, psychological and even religious factors, along with the purely military component. The broadening of the instruments of conflict combined with the blurring of distinctions between military and nonmilitary and between war and peace, led to the appearance of the term "grand strategy" or ("total strategy" or "higher strategy"). Grand strategy meant the art of employing all the resources of a nation (or coalition of nations) to achieve policy objectives [Ref. 1].

The distinction between strategy and tactics is also somewhat blurred. The traditional distinction is that strategy deal with deployment, over wide spaces, long times and large movements, and before contact with the enemy ; tactics deal with actions on the battle field itself. Roginsky[6] defines strategy as the comprehensive direction of power, and tactics as the immediate application of power - a distirction which is not limited to the military area. Liddel-Hart[7] states that tactics lies in the province of

---

[6]See H. Roginsky, The Development of Naval Thought, Naval War College Press 1977.

[7]See B. H. Lidddel-Hart, Strategy, Praeger, New York, 1968.

fighting. Strategy not only stops on the frontier, but has its purpose the reduction of the fighting to the slenderest possible proportions [Ref. 1].

Roger Evered takes the conception of strategy from Liddel-Hart for the strategy in the military field. Liddel-Hart defines strategy as " the art of distributing and applying military means to fulfill the ends of policy." Liddel-Hart distinguished strategy (pure, or military, strategy) from grand strategy (higher or total strategy) as follows ;" the term 'strategy' is best confined to its literal meaning of 'generalship' - the actual direction of military force, as distinct from the policy governing its employment and combining it with other weapons ; economic, political, psychological." Such policy is in application a higher level strategy, for which the term "grand strategy" has been coined [Ref. 1]. For more Liddel-Hart's conception of strategy such as direct and indirect approach, see [Ref. 1].

There are two other uses of the term strategy in the military. The first has to do with "force acquisition" or new military force. The traditional meaning of strategy has to do with deployment and uses of forces. Throughout the present-day defense establishment, however, strategy is used to denote the acquisition of new weapons and technologies to deal with the "threat" that is presumed because the Soviet Union has acquired new weapons or technologies [Ref. 1]. One pregnant comparison by Roger Evered is the analogy it represents to competitive business strategy. A competitor is found to have or to be working on, a new product that has significantly increased capability. This is seen as a threat to the firm, since market share may be lost and growth may suffer if the threat isn't responded to. The firm

evaluates the situation and selects its response in accordance with a strategy. The second other military use of the term strategy has arisen since the strategic bombing of WWII. The use of military force against the nonmilitary aspects of enemy - industry, raw material, population...etc. - is often called strategic. The advent of nuclear weapons , carried by submarines, aircraft or missiles, has increased the use of the term "strategic" in this sense, almost to the point where "strategic" and "nuclear weapons" are synonymous. What is really implied, however, is that nuclear weapons are being used as instruments of threat to the enemy's nonmilitary components [Ref. 1].

Roger Evered stated that both these extended meanings of strategy - force acquisition and threat to the enemy's resources - are compatible with the Liddel-Hart's conception of strategy. They are both examples of the indirect approach by which military forces are being used potentially to gain national advantage without direct use in battle. Military forces are used to modify the psychological experiences of the enemy in order to destroy his purpose, rather than destroy its assets. In short, strategy is viewed as the art of winning protracted struggle between enemies [Ref. 1].

3. The Concept of Strategy in Business Management

The major purpose of the clarification of the concept of business strategy is to give the CEO or president or general manager of a firm an active management approach which embraces the point of view of the CEO and the perspective of the total organization. Andrews[8] defined strategy for the corporate business as:

---

[8]K. R. Andrews, The Concept of Corporate Strategy, Irwin, Homewood, Illinose (1980).

> Corporate strategy is the pattern of decisions in a company that determines and reveals its objectives, purposes or goals, produces the principal policies and plans for achieving those goals, and defines the range of business the company is to pursue, the kind of economic and human organization it is or intends to be, and the nature of the economic and noneconomic contribution it tends to make to its shareholders, and employees, customers and communities.

The concept of strategy quoted above reveals a respect for the CEO or general manager of a firm. Andrews' concept of strategy is dominated by the determination of corporate purpose of economic, human and social terms, and by consideration of the future character of the firm in relation to opportunities, threats and constraints. The highest function of the CEO is the management of the future-oriented purposeful development of the enterprise. The policy problems of business, like those of policy in public affairs, have to do with the choice of purposes, the molding of corporate identity and character, the unending definition of what needs to be done, and the mobilization of resources for the attainment of goals in the face of aggressive competition or adverse circumstances [Ref. 1].

One more view of strategy by Andrews is the process view, i.e., strategy is viewed more as a fluid to be worked with than a thing to be actualized. Andrews' conception of strategy is described as "an organizational process forever in motion" and as the interface between the organizational process of formulation and the organizational process of implementation. And the determination of the purpose is in reality in dynamic interrelation with its implementation [Ref. 1].

In general terms, strategy in the corporate management field is seen as a process for generating viable

directions that lead to satisfactory performance in the market place, given a variety of constraints and the existence of competitions [Ref. 1].

B. STRATEGIC MANAGEMENT IN BUSINESS FIELDS

Strategic management has become a popular phrase as CEOs struggle to cope with the complexities of world economic, political and industrial situations in the 80s [Ref. 4].

1. Defining a Strategic Decision

It is an important factor for the CEOs to specify the differences between strategic decision and tactical decision. Tactical decision making may lead to efficient operations, but strategic decision-making is necessary to assure that an organization achieves long-term success in varying situations. Strategic decisions involve the determination of the basic long term goals and objectives of an organization, the adoption of courses of action, and the allocation of the resources necessary for realizing the goals. The adoption of courses of action and the allocation of resources involve all phases of long range planning [Ref. 3].

George H. Rice Jr. stated that most of the literatures on business policy and strategy argues that strategic 'decisions'

1. Have a significant effect on the overall company operation, rather than having an effect confined to a single portion of the company.
2. Have a relatively long - term effect (e.g. ; product life cycle) rather than a short term effect.

' For more detail related literatures, see [Ref. 3 pp. 62 footnote 8.].

3. Reflect an attempt by the CEO of the company to achieve major company goals and objective.

Rice further stated that the third of this criteria is the most important. The fact that a decision has a long-term impact on the company is not so definitive as is the fact that a manager made the decision deliberately in order to achieve a long-term goal, or to build and shape the company to meet anticipated future demands to be made on it [Ref. 3].

2. The Necessity of Strategic Management

Sometimes the lack of concern with strategic management is attributed to ignorance about the alternative opportunities, or attributed to the inability of management to exercise sophisticated analysis.

The systematic strategic management concepts were not accepted by the private sector (if they were accepted, it was very few). Since the Industrial Revolution, the world has not lacked for industrial leaders who are men of initiative, vision, and inventiveness. Infallible intuition guided their fortunes successfully. Even though part of the success was luck, these individuals did not see the need for formalized strategic management. Rapid growing economy always has room in the market place, our rapid expanding industrial base did not require extensive planning because opportunities were there. As the corporate world became more complex, crowded, mature, and offered fewer opportunities, strategy become more important [Ref. 4].

Today, however, the corporate environment demands that attention be placed on strategic management. New techniques have opened new markets, i.e., health care , communications, automation, information services, and many electronic advances. Many factors complicate the market place ; new jet age ; the energy crunch ; the growth of

large diversified firms ; growth of the world market vs regional market place ; new marketing tools and techniques (e.g.; T.V., Automated phone messages) ; consolidation of older, more mature industries such as the auto industry ; rapid expansion of new and embryonic business such as the computer industry, electronics, and avionics ; the information expansion ; and industrial automation. The impact of any one of these elements on a business has been and can be dramatic and dynamic. These conditions make it necessary for the CEO to focus on the business he/she is in, the environment of the business, the strategic characteristics, and their relative competitive position [Ref. 4].

C. STRATEGIC DECISION PROCESS

Today the corporate environment demands that attention be placed on strategic management. For strategic management, there should be certain decision processes. Strategy has unique characteristics which should be considered before making strategic decisions.

1. The Nature of Strategic Decision Process

Strategic decision-making deals with the uncertainty and risk of a rapidly changing and complex environment. The unique nature of strategic decision making in contrast to other kinds of decision making, is that it must continuously deal with the unfamiliar and the unknown in addition to the familiar and known. The strategic manager must deal with continuously different situations for which there are no formulas, models, programs or deriveable solutions [Ref. 2].

It is meaningful to distinguish the differences between strategic decision making and problem solving, because there usually is some confusion in using the term "decision making" and " problem solving". Familiarity with

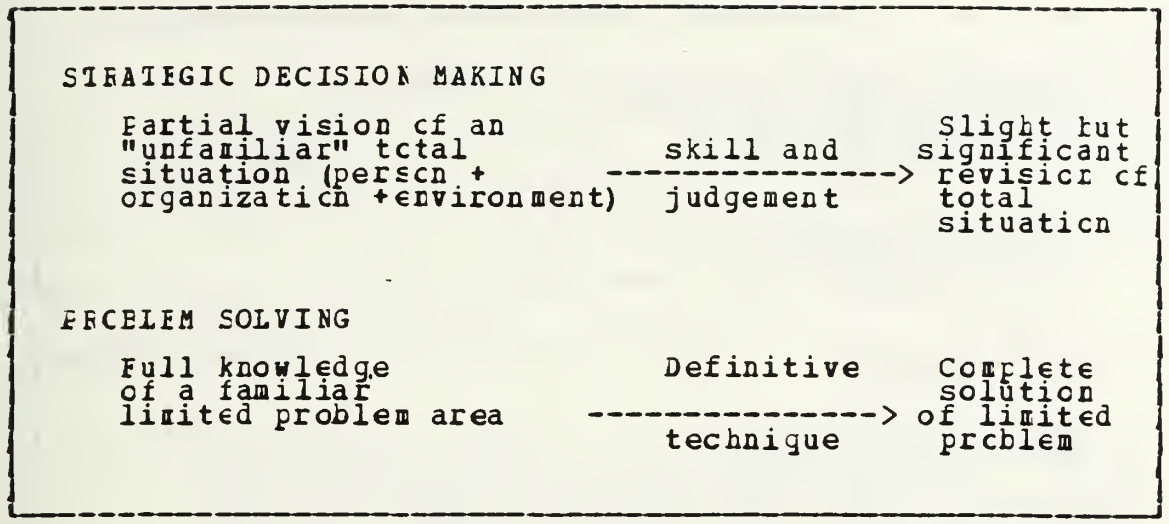
STRATEGIC DECISION MAKING
Partial vision of an "unfamiliar" total situation (person + organization +environment)
skill and judgement
Slight but significant revision of total situation
PROBLEM SOLVING
Full knowledge of a familiar limited problem area
Definitive technique
Complete solution of limited problem

Figure 2.1 Strategic Decision Making and Problem Solving.

a situation implies a non-strategic problem. A problem is defined, a logical method is applied, and a rational solution is worked out which is subsequently implemented with a control procedure. In strategic decision making, there is no one method for handling the problems, because it hasn't arisen before or its precise nature are complex [Ref. 2]. The major distinctions[10] are presented in figure 2.1.

2. The Decision Process Model

Any kind of decision-making follows certain phases, but there exists no perfect model which can deal with all kinds of decision making. A generalized decision process model, as shown in figure 2.2, implies that all decisions go systematically through certain phases.[11] Using the figure 2.2, the first and second phases should be strategic management, and we can see the difference between strategic management and operational management. The strategic

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[10]Figure 2.1 is reproduced from [Ref. 2 PP. 127].

[11]Figure 2.2 is reproduced from [Ref. 2 pp. 129].

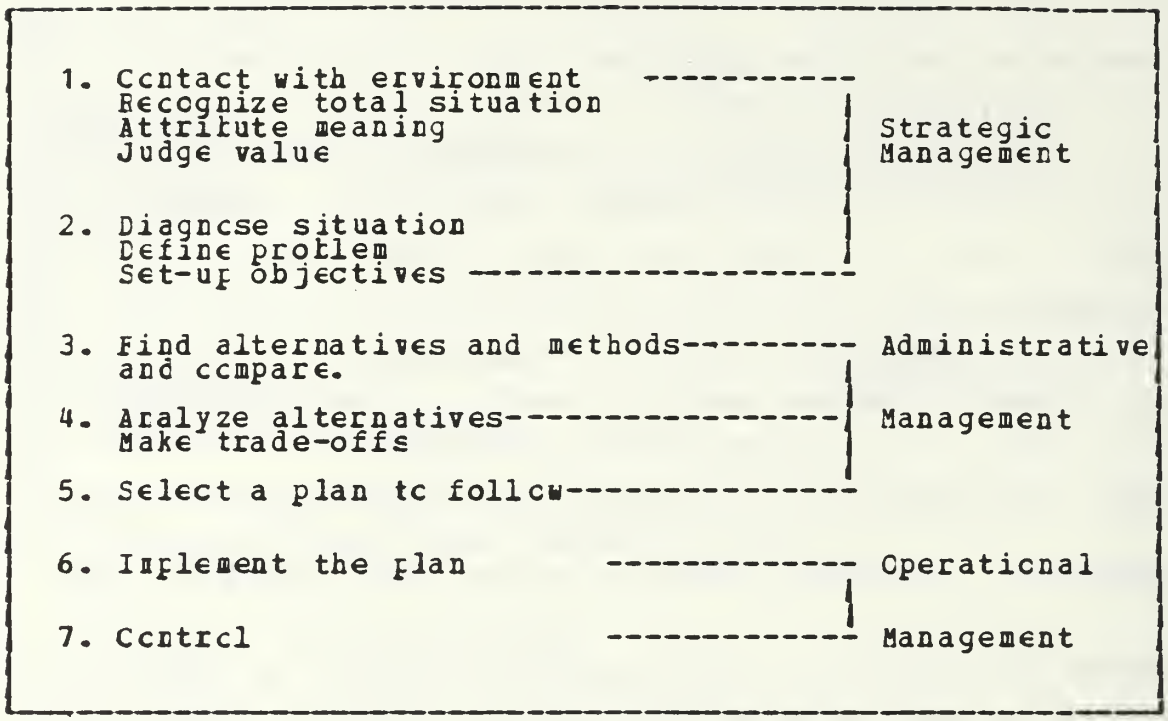

Figure 2.2 The Basic Phases of the Decision Process.

decisicn process brings into play the more qualitative, tacit, and intuitive powers of the human kinds, in addition to its raticnal, logical and quantitative powers. The strategic decision maker must take in and make sense of as much cf the environment as he can. He must sense, perceive, judge and ccmprehend a wide range cf factors and qualities in a specific concrete situation. He must synthesize and balance the rich ccmplex of interdependent forces, factcrs and features. And he mtst select an actien or activity which will mcdify or unbalance the situation in some preferred way [Ref. 2]. For more strategic decision process in open system, change, individual styles, organization, see [Ref. 2 pp. 131 - 136].

D. THE PERSPECTIVES OF STRATEGIC MANAGEMENT

A recent study [Ref. 5] reveals that companies recognize that their problems, challenges, current efforts, and room for progress don't lie primarily in the area of strategic decision making, but in three other related areas ; structure, planning process, people and style.

The study results are;

1. All companies sampled are changing their organizational structure to get better mileage out of their strategic thinking. They feel that their current structure, five or ten years old, is not capable of producing the type of strategic decisions that are dictated by the slow growth environment, the new challenge of technology, or global competition.

2. Also companies are struggling with improving or modifying their strategic planning process to get better strategic decisions. Overall they feel that the way in which the strategic decisions are made is a crucial process to manage in order to get the proper decisions. As a result, many companies are changing their strategic planning cycles and systems or the location of the planner to get new, different, or better strategic decisions.

3. Finally, and without exception, all companies should realize that ,in fact, good strategic decisions and plans will only occur thanks to right motivating themes encouraged by the chief executive and to people who have internalized strategic thinking. People's behavior, judgement, and past experience and the CEO's style very much influence the quality and type of strategic decision made [Ref. 5].

These study results are only from large business companies, but we can think them in connection with some military fields also. In other words, some military may need new structure to get better strategic decisions, need proper strategic planning process, and need right military personnel who can think strategically.

Because of the uncertainties of the future, strategy formulation is extremely difficult without exact forecasting of the future situations and environments. In current

situaticns, high technology and competition, manager of business field should think of strategic management nct only as making strategic decisions, but also as composed of fcur strategic management ccmponents, i.e., decisicns, structure, planning prccess, pecple and style [Ref. 5]. For example, manager should ask fcllowing questions;

1. Which structure will best channel strategic decisicns? Does the current structure and information system help strategic decisions?
2. Dc the people have the experience and capabilities fcr strategic thinking?

Tc improve strategic management, either business or military, the follcwing areas should be considered and researched.

1. Structural change; reorganization of current ccntrol and informatien systems (MIS subsystems) aimed at strategic matters.
2. People selectien and training; select right people and train them to think strategically.
3. Further research is required in strategic planning systems and their impacts on decisions.

For mcre implications for management, see [Ref. 5 PP. 29 - 32].

III. LOGISTICS AND LOGISTICS MANAGEMENT

A. THE ORIGIN OF THE WORD LOGISTICS

Although many efforts has been made to define precisely the concepts of logistics, there remain today many shades of meaning for this term. It is important to understand precisely what the concept encompasses in order that planning and communication may be facilitated [Ref. 6]. Graham W. Rider, USAF, investigated the origin of the word "logistics" in his article [Ref. 6]. It might be meaningful to examine the origin of the word "logistics", even though it was investigated by Rider earlier.[12]

In the beginning there were two words, "Logistikos" and "Logisticus". The first is Greek, the second is Latin, and they both had the same meaning - calculation or reasoning in a mathematical sense. At some later time the word took on a second meaning, so that today "logistics" in current usage can take either one of two totally different definitions. The first meaning , to reason mathematically, has remained constant for centuries. We can trace the second meaning of logistics back to some obscure early usage of the latin root, log-. Latham[13] states that "logluguea", a noun meaning lodge or hut, appeared in records dated 1350 ; and "logic", a verb meaning to lodge or dwell, appeared in 1380. He attributes the French verb, "loger", meaning "to lodge" to this latin antecedent, and we might note that the root's usage is current. The French verb "loger" leads us directly to the second meaning of logistics. As civilized societies

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[12]Most of the contents of the origin of the word "logistics" come directly from [Ref. 6 pp. 25].

[13]Ronald E. Latham, Revised Medieval Latin Word List, London, Oxford University Press, pp 280 - 281, 1965.

grew cut of the Medieval Age and began to acquire scphistication, sc too did the nature of the warfare in which these societies engaged. Armies grew in size, and the problems of administering them also grew. Sometime near the year 1670 an adviser to the French King, Louis XIV, proposed a solution for these military prcblems in the form of new staff structure for the army. Cne of the newly created positions was that cf Marechal General des Logis, whose title came from the verb "loger". This officer was responsible for planning marches, selecting camps, and regulating transportaticn and supply.[14] This irstarce appears as the first applicatien of the new meaning of lcgistics and first organizaticnal usage cf lcgistics as we recognize it today [Ref. 6].

E. MILITARY LOGISTICS

1. The Evolution of the Ccncept of Military Logistics

In many writings, the evolution of concept cf military logistics is described, but Lukert Jr. arranged it systematically by time and ccntents [Ref. 7]. The first serious attempt at a definition of logistics was made in 1838 when Baron Antcine Henry Jomini divide the art of war into five separate and distinct parts - strategy, grand tactics, lcgistics, engineering, and minor tactics. To Jcmini, logistics enccmpassed all military activities except those of actual combat and planning of that combat.[15] The word logistics was little used until Captain Alfred T. Mahan intrcduced it into U.S. naval usage near the end of the 19th century. Mahan's impact on military thought is unquestioned

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[14]James D. Hittle, The Military Staff, Its Histcry and Devel cpment, Harrisburg, Stackpole, pp 48-49, 89, 1961

[15]Robert D. Heinl, Jr., Dictionary of Military and Naval Questions, Anapolis; U.S. Naval Institute, 1966, pp. 175.

and his writings revitalized and enlarged Jomini's concepts [Ref. 7].

Although military planners continued to recognize the necessity for the broad-based industrial and economic support envisioned by Mahan, official definitions of logistics remained sketchy until the term came into vogue in WWII. Until WWII, logistics was described only the traditionally narrow functions of movement and supply which characterized its usage through the period. Since WWII, the trend in official definitions has been toward a gradual widening of the functions included in the generic field of military logistics. But the economic and mobilization aspects of logistics, envisioned by Mahan, have yet to gain official sanction or to be included in any official definitions of the term [Ref. 7]. At the time of 1974, the official dictionary of the DOD still reads ;

> Logistics ; The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with ; (1) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of material ; (2) movement, evacuation and hospitalization of personnel ; (3) acquisition of construction, maintenance, operation and disposition of facilities ; and (4) acquisition or furnishing of services.[16]

There is some evidence that the term logistics is again being utilized to encompass many of the national and international aspects envisioned by Jomini and Mahan. Perhaps even of more importance is the continuing recognition of the interdependence of strategy, logistics, and national security. These trends can be traced by "The Meaning of Logistics" written after WWII, by Duncan Ballantine. For it is in his discussions that we see the

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[16]U.S. Joint Chief of Staff, Dictionary of U.S. Military Terms for Joint Usage, JCS Pub. 1, Washington, U.S. Govt. Print. Off., 1966

first emphasis on defining logistics as including all those processes critical to the development of a nation's strategy. Ballantine provides one of the first broad-based definitions of the term, when notes that; ... logistics signifies the total process by which the resources of a nation - material and human - are mobilized and directed toward the accomplishment of military ends.... Broadly conceived, the logistics process is thus the means where by the raw war-making capacity of the nation is transformed into instruments of force ready to be employed in pursuit of strategic or tactical objectives.[17] Duncan Ballantine also developed a theory which credited logistics as the "bridge" between the two elements necessary for a nation to successfully wage war - its military forces and its economic capabilities [Ref. 7].

Henry E. Eccles has extended Ballantine's theories. He has constantly fought for the acceptance and legitimization of logistics as the key-stone of a bridge between the nation's war potential and the forces it fields for battle. Eccles points out that the industrial capacity of a nation limits the creation of combat forces while the employment of those forces is limited by the military commander's logistics restraints.[18]

In 1977, Colonel Edward P. Lukert, Jr. USA has broadened and separated the term logistics from its traditional military and wartime connotation - Logistics and as its subsets strategic logistics and operational logistics [Ref. 7].

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[17]Duncan S. Ballantine, U.S. Naval Logistics in the Second World War, Princeton University Press, PP. 1, 1949.

[18]RADM Henry E. Eccles, U.S. Navy (Ret), The Military and Civilian Aspects of Logistics, Paper presented at the convention of the Society of Logistics Engineers, L.A. Sept., 1968.

2. The Concept of Military Logistics

As one can see in the evolution of the concept of military logistics, since WWII, the importance of logistics has been stressed at all levels of military activities, and military writers have been stressed its various aspects at length. Even though we understand logistics better than before the war, we still have many deficiencies in the field of logistics plan and capabilities. Among the obstacles to improvement are the uncertainties that exist as to the meaning of the word itself and as to the proper place of logistics in military organizations and plans. This is because logistics has several distinct aspects and in each aspects the definitions and descriptions differ. Frequently, therefore, people may be talking from diverse points of view without realizing the effect this has on their descriptions and opinions. Each will be ascribing a different meaning to the word without realizing it. There exist many writings which define the logistics concept in the military field. Among them Eccles defines logistics in comparative term with other art or science - pure logistics and applied logistics. Graham W. Rider presents a cumulative approach in his article [Ref. 6].

Graham W. Rider defined logistics at three levels, i.e., socio-economic function, system process, work-functional levels. His definition of military logistics is as follow;

> Military logistics : The social and economic function of Physical Supply and Physical Distribution that creates time and place value for military goods and services. As a military organizational system, the purpose of logistics is accomplished through the processes of Requirements Determination, Acquisition, Distribution, and Conservation. The organizational work-functions or physical tasks that must be performed to accomplish the purpose of military logistics are Traffic Management, Supply, Maintenance, and Facilities Engineering [Ref. 6].

Rider commented about his definition of military logistics as follow;

> At the socio-economic level, the overall purpose of logistics is to create time and place utility, or value, in goods and services. In practical terms, logistics is the business of getting the right thing to the right place at the right time. This generally takes place in two stages, i.e., we acquire it from a manufacturer and then we distribute it to a user. This two step function, sometimes called producer logistics and consumer logistics, is best described as physical supply and physical distribution.
>
> The system processes describe a series of action taken to accomplish the overall purpose of logistics. They illustrate the fact that, although logistics can be described as a two-step function in socio-economic terms, in fact logistics is a continuous closed system in the military organization. Given a operational need, logistics translates the need into specific requirement, acquire the goods and services so specifies, distributes them, and conserves them through such actions as protective storage and maintenance. Conservation also includes disposal so that when an item is no longer needed it can be removed from inventory and a new requirement determined.
>
> At the work-function level, the terms used to describe the actual jobs that a logistic organization should do. They explain in practical terms the system processes of logistics - these are the jobs that must be done to get the right thing to the right place at the right time. The jobs should be readily recognizable [Ref. 6].

E. Eccles defined military logistics in two ways - pure logistics and applied logistics. He stated that the word logistics is an abstract term which represents a very practical reality; in its abstract sense it, like strategy, tactics, economics, and politics, is not susceptible to a single and permanent definition; rather it can be described in a variety of ways in very general terms; if it is to be understood, it must be approached from various points of view, and it must discussed and described by reference to other intangibles and abstract terms; it is only through the consideration of one abstract term with relation to the other abstract terms with which it is naturally associated that the true picture can be developed and described.

He also stated that;

> Pure logistics is merely a scientific inquiry into the theory of logistics - its scope and function in the

science of war, with a broad outline of its organization. Applied logistics rests upon the pure, and concerns itself, in accordance with general principles, with detailed manner of dividing labor in the logistical field in the preparation of war during its duration [Ref. 8].

a. Pure Logistics

Eccles defined pure logistics by using the following three descriptions of abstract logistics;

1. Logistics is all that part of the war which is not included in strategy and tactics.
2. Strategy and tactics provided the scheme for the conduct of military operations ; logistics provides the means therefore.
3. The logistics process is, at one and the same time, the military element in the nation's economy and the economic element in its military operations [Ref. 8].

From above descriptions, he saw war itself in its abstract sense as comprising three interlocked abstractions - strategy, tactics, and logistics.

Based on history, we find that war is a matter of infiritive variation, in which no two situations are precisely the same, and that in all war situations the actions and decisions are based upon a blend of strategical, tactical, and logistical considerations. If we consider these abstract terms as three overlapping disks, we can see where some situations involve all three considerations, others involve two, and some only one. However, as we study, we realize that the dividing lines tend to blur and in some cases to vanish. A somewhat different approach would be to say that, in its abstract sense, war is a combination of military, political, economic, and geographic situations and considerations. Here again we find a variable blend of abstract terms, each of which is subject to a variety of

meanings [Ref. 8]. One more view of pure logistics by Eccles is the relationship between military and economic conditions.

> In order to fight modern war, we must mobilize our economic and industrial resources in order to create and support the necessary combat forces and to maintain our civil economy and health. Civil logistics is the mobilization of men and material, and the rendering of services, to the operating military forces [Ref. 8].

From the description that "logistics provides the means for the conduct of military operations" and other statements above, Eccles has placed logistics on a coequal level with strategy and tactics, thus forming the three major subdivisions of the art and science of war, and defined logistics by a relatively simple and broad abstract level using simple terms - terms that can be readily related and are adequate to cover the major problems of war. In general terms, pure logistics is an abstract term used to indicate the whole complex process whereby the means of war necessary to support a national strategy are determined, procured, and finally distributed to the combat commanders [Ref. 8].

b. Applied Logistics

Eccles emphasized the importance of applied logistics as follow;

> Abstract speculations, theories, and principles have never prepared a nation to fight and have never won a war. All they have done is to enable man to understand his war problems and to assist him to solve them. In order to prepare for war, we must define the practical tasks of the armed forces and we must assign these tasks to specific organizations and individuals. For this purpose we have organized the DOD and the armed forces, and authoritative definitions have been published and specific tasks assigned [Ref. 8].

Eccles considered applied logistics largely in two levels - international and national levels (mobilization logistics), and operational logistics. In the practical field, the definition of applied logistics varies in accordance with the level of the organization being considered. But always military logistics is concerned with "furnishing the means of war", which are material, men, facilities, and services. Applied logistics represents the everyday practical application of this abstract process. The objective of all logistic effort is the creation and sustained support of adequate combat forces. Economy is an essential function in the attainment of this objective. The applied logistics process of providing men, material, facilities, and services, comprises the performance of many specialized and technical functions. These functions include ship and aircraft design, construction, maintenance, and repair ; air and naval base design, construction, and operation ; the operation of an intricate supply system ; the provision of fuel, ordnance, and ammunition ; transportation of all sorts ; and personnel and medical services. Some of these practical functions are performed by staff corps officers and line specialists, some by unrestricted line officers, and some by civilians [Ref. 8].

On the international and national levels, applied logistics deals with the broadest economic and industrial matters such as ; the sources and availabilities of raw materials; the state of the domestic economy and finances ; the availability of manufacturing plants, skilled and unskilled labor, design, and production engineers, management; and other similar affairs. Some persons may prefer to consider this as a combination of economic mobilization, and military planning. The precise levels attached to the process are not as important as understanding the nature and interrelationship of the functions performed. On

the highest level the international and national situations and decisions must be continually interrelated. It is vital to seek harmony among the national and international policies, strategic plans, and military programs. While it is naive to expect to achieve complete harmony, it is very important that we avoid contradiction. Policies and plans made by both international and national agencies, but action is almost always by national agencies. There is an extraordinary complex mixture of political, economic, strategic, and logistic factors [Ref. 8].

Planning for the actual conduct of "operational logistics" is based upon the strategic plans and the broad logistics plans and policies of the theater and commanders and upon their estimates of requirements. All of these furnish the necessary guidance to the type commanders who actually submit the recognitions and operate the basic logistic services afloat. As we move from the theaters through the fleets to the task forces, from the realm of long-range plans and forecasts, to the actual repair and replenishment of the combat forces, the techniques of tactical logistics are under constant scrutiny and improvement in actual practice. However, the techniques and actual procedures of so-called theater and fleet strategical logistics are frequently imperfect and sometimes neglected in peacetime. Anyone can understand the effect of a ship at sea running out of fuel and ammunition. But few officers understand the importance and nature of the long-range concurrent strategic-operational logistics planning or the planning that will insure the readiness of task forces for sustained combat operations in time of sudden emergency. In considering this division of logistics into various levels, we should always remember that each level overlaps with the other, both above and below. There can never be a sharp "chop line" of interest, although there are various "chop

lines" of specific action responsibility. In all of the above stages and relationships we find changing general characteristics and emphasis [Ref. 8].

Both pure and applied logistics can be roughly divided into two general classifications ; mobilization logistics and operational logistics. Before operational logistics can function, there must be the prior performance of the mobilization logistics function. Mobilization logistics and operational logistics have a large area in common. The nature of the war and its component parts is such that sharp dividing lines can not be drawn between strategy, tactics, and logistics. Instead, they blend and overlap in many continually varying ways. This is equally true whether one is thinking in abstract terms or in practical functional terms. An understanding of both pure logistics and broad aspects of applied logistics is essential to the exercise of high command. Control of overall applied logistics requires a knowledge of the problems of high command - particularly a knowledge of the relationships between the functional elements of applied logistics [Ref. 8].

If one compare the definitions of military logistics defined by Rider and Eccles, one can find the following ;

1. In terms of time, Eccles defined logistics in the 1950's, but Rider did in the 1970's, and both after WWII.
2. They tried to define military logistics by dividing into several levels, or into some different aspects.
3. If we consider their definitions more deeply, we can find that both deal with military logistics from strategic aspects to operational aspects.

If we take into account other writers' efforts to define military logistics , we can find that actually the basic contents may be equal, but they differ in approach.

As a conclusion, we can define military logistics as; the related activities to create, to maintain and to support military forces which will be in war or in peace. As subsets of above definition, we can divide it further into strategic logistics and operational logistics. Strategic logistics - the activities which support military strategy, operational logistics - the activities which support military forces and operations. The activities may be design, development, production, acquisition, storage, movement, distribution, maintenance, disposition, construction, operations, and services according to specific military logistics objectives.

C. BUSINESS LOGISTICS

Different types of logistician have different job specifications. The logistician in one company may have an entirely different set of job responsibilities from one in another company. To illustrate, the logistician who may be referred to as the distribution manager frequently deals with the outbound flow of goods and responsible for warehousing, inventory management, and transportation, whereas, the logistician whose title is traffic manager will deal only with transportation. The materials management title is given to the logistician who deals with inbound flow of materials and has the responsibility for purchasing and for inbound transportation. Finally, the logistician whose job deals with engineering may focus on design and maintainability. Thus, with each different title comes a different set of responsibility. One reason of these confusion may be the unclarity of the definition of logistics used in industry or business.

Some definitions of business logistics are ;

1. Logistics deals with the total product flow from the inbound raw materials to the outbound finished goods. The activities included in logistics are warehousing, transportation, inventory management and materials handling.
2. Logistics deals with the total product life cycle from the concept and design phase on through to the production of the product and its servicing in the field.
3. Logistics deals with the transportation and inventorying of the product in the field and its handling at the customer location.
4. Logistics is a system discipline dealing with operations planning, inventory control, and transportation scheduling.

As one can see, the different definitions emphasize the different aspects of the logistician's responsibility. The variances in definition seem to have their origins in the different emphasis areas as taught in different discipline in the academic realm.

Most papers on logistics refer explicitly or implicitly to the domestic context. For most economies, the domestic rather than international context is more relevant. However, the need to balance trade flows and the stagnation of some domestic markets has encouraged a growing interest in exporting and, consequently, international distribution. For this reason, it should be meaningful to investigate the concept of business logistics in two parts - domestic logistics and international logistics.

1. Domestic Business Logistics

For about three hundred years, logistics was the exclusive property of military men. It appeared as an organizational function in a number of different armies, and it

was subject of debate among military scholars as far back as the early 1880's. But, not until WWII did logistics find a permanent place in the military profession. Much of what was learned must have been carried to the business community by men who left the service at the end of the war. Knowledge of the military logistics made a transition to the business and academic communities [Ref. 9]. The transition alleged by Graham W. Rider is as follow :

> In 1951, Oskar Morgenstern who was working with the RAND CO. at the time, wrote that " there is an immediate similarity between military logistics and the logistical problems that have to be solved daily in business."He went on to formulate the problems of studying logistics through comparison of military and business organizational parameters.
>
> John H. Fredrick published a college text in 1956 on traffic management and that started by noting the same situation; "Industrial traffic management and transportation strategy are as important as logistics in military operations. Industry is discovering this, and it has meant the enhancement of the prestige of industrial traffic management.
>
> Robert M. Ivie, who is a coauthor of the text, Business Logistics, advised that he and the others who cooperated in writing the text were teaching a course in Industrial Traffic Management at Stanford in 1956. He said that they had developed the course to a point where it covered much more of business activity than that usually found in a study of traffic management. Accordingly, they decided to call their course Business Logistics.
>
> 1960 was a bench mark year for literature on business logistics as text books and articles in a variety of journals were published in significant numbers. Growth has concerned at a measured pace since that time. Along the way, people from academic areas other than Industrial Traffic Management became interested enough to claim that logistics and their areas of interest were similar. Hence, business logistics has been equated with Physical Distribution Management, Marketing Management, and Production Management. In fact, each had a different interpretation of the same thing [Ref. 9].

Many writers of logistics viewed logistics from quite different points of view. Some saw it as a socio-economic function, that is, logistics serves society by performing some economic function such as creating value. Others viewed logistics as a system or subsystem of the firm. They described business logistics in terminology that led to constructs called system processes. The final view of

logistics, and the most often encountered, offered definitions of logistics in work-function terms. These terms described the actual jobs usually found being done in business firms that they felt were an integrated part of the logistics department's responsibility [Ref. 9]. Some useful, different approaches of concept of business logistics by Graham W. Rider are[19]

1. Physical Supply and Physical Distribution

These actions which are required to facilitate the creation of time and place utility for inbound and outbound goods and services that are demanded for either production or consumption (socio-economic functional point of view).

2. Acquisition, Movement, Storage

At the systems approach, logistics acquires goods and services as needed by other parts of the firm, moves them to the place where they are needed, and stores them until the time occurs when they are needed. The system monitors these processes so that as services and goods are consumed, signals are generated through the feedback loop that key the acquisition process and a smooth flow through the system is assured.

Acquisition ; Providing goods and services which are required by the organization. It includes purchasing, leasing, renting, or hiring these goods and services as well as decisions to acquire them from within the resources of the orgarization as well as from without.

Movement ; Reallocating goods from one point to another on one or more of the various modes of transportation. In general, goods are moved as raw materials from origin to production as finished goods, from production to consumption. It also includes movement within the

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[19] The three different approaches of the concept of business logistics introduced here are mostly from [Ref. 9] PP. 39-41.

organizatior as well as movement between the organization and its suppliers and customers.

Storage ; The protective holding of inventories of raw materials and finished goods. It involves determining the size of invertories, and decisions regarding locations.

3. Traffic Management, Warehousing, Inventory Control, Procurement

At the organizational level, the following fields are standing for business logistics.

Traffic Management ; Managing transportation of incoming and outgoing goods including the movement of goods or both organizationally owned and control of movement and service; cost ; schedule; paper-work; and price.

Warehousing ; The assembly, storage, and distribution of goods both incoming and outgoing. It includes materials handling systems, system design, and equipment for receiving , cataloging, packing if not part of production, crating, loading, and shipping of goods to production or consumption. Warehousing also involves decisions about leasing or renting public facilities as opposed to purchase or construction of private facilities, and decisions about warehouse design and location.

Inventory Control ; The planning for and control of the magnitude and costs of stocks, sometimes called stores, of incoming and outgoing goods. It includes those activities known as production control and production scheduling, but only in the limited sense of controlling the quantity of outgoing goods produced over any given period of time as well as the quantity of incoming goods to be used in production. It involves the identification and cataloging of items in inventory for ease of control and coordination with other organizational activities.

Procurement ; The planning for and control of the purchasing function of developing new sources of supply,

maintaining the appropriate relationships with existing sources, developing catalogs and other information sources. It includes the purchasing functions of buying in terms of quality, quantity, price, source, and time as well as analysis and decisions regarding those criteria. It includes the post-purchasing functions of follow-up, expediting, and data recording and reporting.

As one can see above, a great deal of confusion exists about the concept of business logistics. One possible reason for this confusion may be the diverse sources of writers; some from military, others from academic fields such as industrial traffic, physical distribution, marketing, and materials management. By equating logistics to their own disciplines, they have introduced terminology not generally recognizable by all.

After considering all three approaches, even though the basic idea is same as military logistics stated in earlier section, Graham W. Rider defines business logistics as ;

> The socio-economic function of physical supply and physical distribution that creates time and place utility for goods and services. As a system, logistics is comprehended by the process of acquisition, movement, and storage. In work-functional terms, logistics is procurement, traffic management, warehousing, and inventory control [Ref. 9].

This definition of business logistics covers all aspects of logistics of business field, and we can take it as a definition of business logistics.

2. International Logistics

G. J. Davies [Ref. 10] proposed a separate logistics concept for international distribution. The international logistics concept emphasizes the movement of the export order rather than the movement of goods. It ignores the

movement of materials into and within te firm which remains part cf the domestic logistics system. Davies stated in his article [Ref. 10] that;

> The logistics concept should be transferable from domestic to international business with no greater difficulty than applying the concept to one product type and then to another. There are, however, a number of differences between national and internaticnal distribution. The major three areas of differences are in documentation, in the presence of a freight forwarder, and in order processing. Here in international logistics, again organizaticnal prcblems shculd be considered. If international distribution were cbviously and clcsely related to domestic distributicn, a high level of integration might have been expected. The contrcl cver delivery promises and who controls the physical delivery cf goods is important one.
>
> The differences between domestic and international logistics might be in customers (end users), and varicus links tc banks, insurance companies, customers and freight forwarder have to be added to the domestic system, and crder processing and documentation are significant elements affecting the flow cf goods and money in International logistics.
>
> The problems encountered by a distribution system heavily invclved in international business are more familiar to Eurcpean management than American management. Many countries have shifted their base of international commitment from a relatively simple export - import operation tc branch operations abroad. The result of this shift from an export - import orientation tc a multi-national business operation has caused some sigrificant changes in the total distribution mission of the firm. It is not uncommon to ship subassemblies frcm one ccuntry, raw materials from a secondary for final assembly in a third country. The finished prcduct is then scld in the domestic market, exported to a third ccuntry and perhaps reimported to the country supplying the subassemblies. This evolving distribution pattern in internaticnal operations has created a significant challenge for distributicr management in several ways ;

1. The documentation required for these multiple movements of raw materials, subassemblies and finished gcods is itself a formidable task.

2. Creating least cost movements in an omni-directional distribution environment presents an ongoing prcblem fcr the logistics manager.

3. The distribution planning function must include a ccnsideration cf different tariffs, export requirements, packaging, tax consessions, and reciprocal tariff arrangements.

Field inventory[20] in the international context now relates to the stock held by a subsidiary or agent often not directly controlled by the trader. The customer is often the subsidiary or agent rather than the end user. Furthermore, the buyer, whoever he is, may wish to control the freight link. Somewhere, the various links to banks, insurance companies, customers and freight forwarder have to be added to the domestic system. Order processing and documentation are now significant elements affecting the flow of goods and money. C. J. Davies proposes that the domestic logistics concept is, therefore, inappropriate to international trade. International problems are not so associated with the various costs in moving goods, but are more associated with the cost penalties associated with failing to move the order from the customer, through the firm and back to customer. Recognizing the physical movement of goods as a system leads to greater efficiency in domestic trade. Recognizing the movement of the order as a system has a similar potential in international trade.

Figure 3.2 represents Davies' international logistics, and the concept recognizes two types of activity, Liaison and Tasks. The central tasks activity consists of three elements, receiving the inquiry, assembling the order and dispatching the order. The order is received from the customer and returned to him in the form of goods. Two types of output are produced, the delivery promise and documentation. To move from one task to another, the international logistics function has to liaise with other functions internal and external to the firm. Credit rating may be possible within the firm or may require contact with an external body who insure the exporter's risk from commercial

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[20]See the figure 3.1, figure 3.1 is reproduced from [Ref. 10 pp. 48].

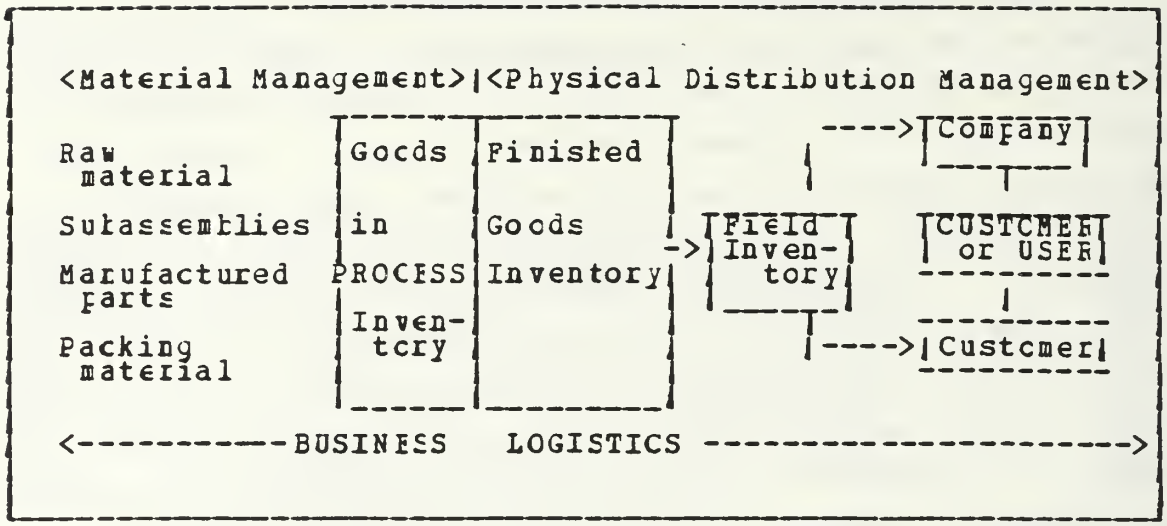

Figure 3.1 The Business Logistics Concept.

default or political action[21] [Ref. 10]. To move to the second task, the domestic operation in the firm needs to be consulted regarding the availability of stock or the lead-time on supply. The international logistics function can now produce its first output of significance, the delivery promise. Liaising the rest of the firm regarding the stock allows the assembly of the export order. But before the order can be dispatched, the goods will be insured, the forwarder, if employed, will need advising and the international logistics function will need to insure it has assembled the data required for documentation. On regular traffic flows, many companies undertake their own forwarding. Davies has argued that having one function, either the international logistics function or the forwarder, responsible for both of the shipping and forwarding roles contributed to export efficiency in that one function can achieve an overview of the export process. The third task element, dispatch order, should be seen,

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[21]Figure 3.2 is reproduced from [Ref. 10 pp. 52].

therefcre, as a combination of domestic dispatch management and international forwarding [Ref. 10].

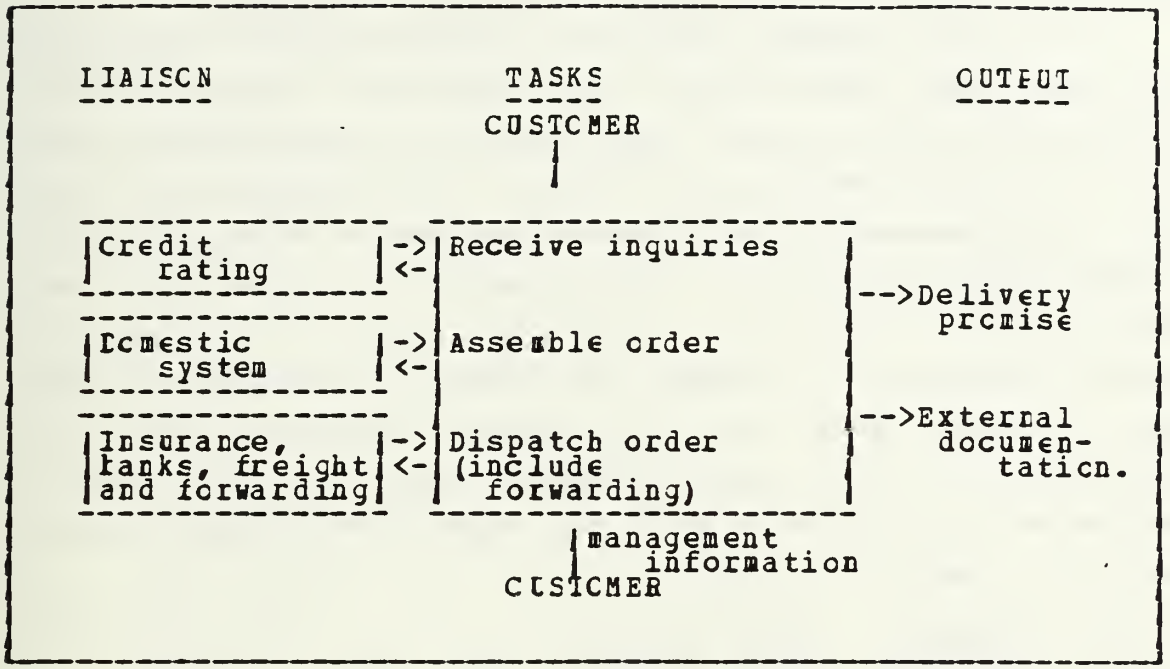

Figure 3.2 The International Logistics Concept.

D. INTEGRATED LOGISTICS SUPPORT (ILS)

All element of lcgistics system have long-term aspects which have to be put into a planning system, i.e., the planning cf a new transpcrtation methods, the planning cf a new distributicn center. This planning must be coupled with the productien and marketing planning, but the traditional crganization is often fourd to be a barrier. Acceptance of the logistics management might require ancther organizational structure and therefcre needs tcp-management's approval. All big success stories in logistics start with the suppcrt of the tcp. Today, tcp-management's concern for lcgistics becomes more important because all pressing problems seem to

have their impact on logistics ; the high cost of money increases the need for a better management of inventories, the high competition calls for simultaneous search for cost reduction and better service levels.

The heart of the logistics concept is an integrated approach where cost savings are identified by considering total costs of the system. This approach already implies the need for overall management. Since the decisions about the different elements of the logistics system (transportation, inventories, facilities, utilization, communications) are traditionally made within different functions or departments. However, the need for overall management becomes more stringent where the effectiveness of the companies as a whole is considered, i.e., when the logistics system has to be brought into balance with the production system and the marketing system.

1. Logistics System Concept

The logistics system in its totality is concerned with the movement and storage of products from their raw state, through various stages of sub-assembly, packaging, transportation and delivery to the final customer. Depending upon how widely one wishes to define the system it can be seen that logistics considerations are involved throughout the marketing and exchange channel from the sources of supply to the points of final consumption. To add to the complexity it is unlikely that the same corporate entity will be involved, or will exist which all impinge upon the operation of the total system, e.g., the purchasing subsystem, the production subsystem, the transportation subsystem and so on.

The logistics system concept is an attempt to transcend the problems of separate functions or subsystems by identifying the interfaces between these sub-systems and

advising means whereby they relate to each other in the most effective way - thus ensuring that internal contradictions in the corporate activity are minimized.

Adopting the total systems concept in any context implies an acceptance of the following points;

1. The whole is primary, and the parts are secondary.
2. Integration is the condition of the inter-relatedness of the many parts within one.
3. The parts so constitute an indissoluble whole that no part can be affected without affecting all other parts.
4. Parts play their role in the light of the purpose for which the whole exists.
5. The nature of the parts and its function is derived from its position in the whole, and its behavior is regulated by the whole to part relationship.
6. The whole is any system or complex or configuration of energy and behaves like a single piece no matter how complex.
7. Everything should start with the whole as a premise and parts and their relationship should evolve [Ref. 11].

The clear implications here is that the conventional organization of many companies' logistics activities along strictly delineated functional lines presents a real barrier to the construction of integrated flow systems. What the logistics systems concept in fact implies is that an organizational pattern that cuts across functional boundaries is required. Furthermore, traditional functional organization has concerned itself more with the way that inputs are consumed with way that outputs are generated. Traditionally the activities of the firm mirror its functional organization. Some conflicts may occur between functions of the firm or sub-systems when goals are determined by functions

without regard for the impact of their actions upon the total system. This very common feature of corporate structure is called by the operations researchers as "sub-optimization" - in other words, a failure to recognize that the whole can sometimes be less than the sum of its parts [Ref. 11].

2. The Integrated Logistics Support (ILS) In The Military Field

To those who are responsible for the operation of military systems and equipment, it has become increasingly obvious that a major limiting factor in their operational capability and availability is logistic support. Operational commanders carefully watch the statistics on those items of equipment that are not operationally ready because of maintenance or supply difficulties. They have come to recognize the importance of having an adequate supply of spare parts, test and support equipment, and a sufficient number of trained personnel to operate and maintain the system. In short, they have come to recognize the importance of integrated logistics support (ILS). Our reliance on sophisticated equipment rather than on sheer manpower in future combat situations emphasize the necessity for good logistics planning and places real importance on the integration of logistics consideration in the design process[22] [Ref. 13].

In the mid 1960's the emphasis on sub-optimization of operational performance was recognized and there was a turn around in logistics support philosophy. Factors contributing to this turn around in thought were ;

1. Operating cost exceeded the acquisition cost.
2. Unacceptable availability rates of major systems.

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[22]The ILSP is represented in figure 3.3, and figure 3.3 is reproduced from [Ref. 13].

3. Excessive maintenance repair time.
4. Inability of the standard system to provide adequate support.

The purpose of the ILS program is to improve operational readiness and logistics support management while minimizing operating and support costs. The key continuing objectives for achieving this purpose are;

1. Integration of logistic consideration into the design. The design phase is inherently iterative and design decisions affect logistics support.
2. Timely availability of all required logistics resources. All elements of the support system must be planned, acquired, tested, and deployed in phase with the system or equipment.

The concept of ILS and processes of ILS planning are not a panacea for all the problems associated with the acquisition and support of new sophisticated equipment. However, they do provide a system for the integration of logistic consideration into the design and the assurance of timely availability of all required logistic resources [Ref. 13].

3. Integrated Distribution Management in Business Field

Prior to 1960's the total distribution mission of the firm was not conceptualized by management as an integrated task. Rather the objective of physical supply was achieved in a series of fragmented, uncoordinated movement and storage sub-functions. For example, customer order processing was the responsibility of the accounting function; traffic or transportation management to manufacturing; warehousing to marketing, etc. With this state of functional development, it was impossible to integrate the various sub-tasks involved in the total distribution task either in a conceptual or operational context. The sub-optimization

PART I. General
1. System Description.
2. Program Management.
3. Applicable Documents.

PART II. Concepts and Strategy.
1. Operational and organizational concept.
2. Acquisition Strategy.
3. Logistics Support Analysis (LSA).
4. Test and Evaluation Concept.
5. ILS Elements.
   Design and Integration
   Maintenance Plan
   Manpower and Personnel
   Supply Support
   Support Equipment and TMDE (Test Measurement and Diagnostic Equipment)
   Training and Training Devices
   Technical Data
   Computer Resources Support
   Packaging, Handling and Storage
   Transportation and Transportability
   Facilities
   Standardization and Interoperability(S & I)
6. Logistics Support Resource Funds.

PART III. ILS Milestone Schedule.

Figure 3.3 Integrated Logistics Support Plan (IILSP).

resulting this poor coordination led to not only poor distribution performance from the customer's point of view, but in some cases inefficiency, waste, and morale problems from a management point of view. The traffic manager, evaluated on the size of his freight bill, shipped by full carlots and by the most economical transport mode. The sales man, evaluated on the total sales, expected reliable and rapid customer order service. The plant manager, evaluated on unit production costs, wanted to make all red ones in one size. These part of conflict within the organization were frequently resolved on the basis of departmental power with resulting morale, efficiency, and service deterioration [Ref. 11].

Beginning in the 1960's, a number of forward-thinking firms began to consider the potential of

integrating their distribution efforts into a unified whole, both from an organizational and a control perspective [Ref. 11].

It might be worthwhile to speculate the causes or factors for the growing interest by businessmen in integrated distribution systems during the 1950's and 1960's. The following are probably four primary factors which shaped the development of distribution thinking.[23]

1. A more scientific approach to business management; There was a renewed interest in scientific management of the business enterprise. Through the WWII period, large gains have been made in the technology of production. After WWII, there was increasing emphasis upon the marketing function. The amount spent on the advertising in the American economy quadrupled. The number of new products launched increased almost geometrically. Thus, by the mid-fifties the businessman found himself in a situation where production technology was well advanced and marketing costs were steadily increasing. In order to reduce costs and remain competitive in the marketing place, one of the few areas that was relatively untouched was the distribution of the product. In many firms the cost of distribution represents from 18 to 45% of total costs. It would seem, therefore, that the new focus upon efficiency in distribution was a logical outgrowth of the American business environment.
2. Advance in computer technology ; A second major cause of the "Distribution Revolution", was the advent of new technology in data processing. One side effect of the computer has been its impact upon total integration of management within the firm. This has

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[23]Primary factors are adopted from [Ref. 11].

caused a breakdown in some of the traditional departmentalization within the firm and paved the way for integrated distribution management.

3. Importance of distribution in providing increased levels of customer satisfaction ; A third reason of the increasing management attention to distribution is management's recognition of the importance of distribution in providing customer satisfaction. Particularly, those companies selling relatively homogeneous products, often compete on the basis of efficiency in distribution and their profits in large measure are determined by their success in affecting sound distribution.

4. Profit leverage ; The fourth major influence upon management thinking about distribution is the profit leverage available from reduced logistics cost. As markets constantly expanded, emphasis was upon increased sales. As the tempo of domestic and international competition increased, a profit squeeze was reflected in many American firm's balance sheet.

During 1960's, three approaches to the integrated distribution management have emerged. Alternative approaches of integrated distribution systems are as follow[24] ;

1. The physical distribution concept is basically concerned with the integration of finished goods distribution. Many of the firm's that have taken this approach are in the high volume consumer packaged goods business where the sales or marketing department has traditionally been functionally responsible for the distribution task.

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[24]See [Ref. 11] for more approaches.

2. The materials management approach usually evolves out of a traditional purchasing orientation to materials flow. As one can see in figure 3.1 this approach focuses on acquisition of raw materials, supplies, and goods-in-process inventories. Many of the firms which take this type of approach are involved in industrial markets where the range of potential customers is limited and value added by manufacturing is relatively high.
3. The third area is Business Logistics, the concept that has its roots in the science of military logistics

In a general sense, the concept of integrated distribution may be expressed as; Integrated distribution management is an approach to the distribution mission of the firm wher by two or more of the functions involved in moving goods from source to user are integrated and viewed as an integrated system for purposes of managerial planning, implementation and control. The scope of the alternative approaches to integrated distribution management is not clearly defined due to both the newness of the concept and the fact that the individual business firm tailors the concept to an ongoing organizational environment. The distribution mission of a firm encompasses two or more functions[25] and they are listed in the table III.

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[25]Table I is reproduced from [Ref. 12 PP. 7, table 1.].

TABLE I

Total Distribution Mission of a Firm

1. Facilities location
2. Purchasing
3. Packaging
4. Production control
5. Materials handling
6. Warehousing and storaging
7. Inventory control
8. Traffic and transportation.
9. Order processing
10. Distribution communications
11. Parts and service support
12. Personnel movement
14. Salvage and scrap disposal
15. Customer distribution program
16. Vendor distribution program

IV. STRATEGY AND LOGISTICS

So far, we examined the strategic management concept, and logistics management concept for both the business and military fields. To get better strategy and logistics policy, it may be required to investigate the relationships between strategy and logistics, the impacts of logistics on strategy, the role or responsibilities of command and staffs, and logistics and strategy flexibility.

A. THE RELATIONSHIPS BETWEEN STRATEGY AND LOGISTICS

Any conventional war which we may engage in may be fought under the threat of nuclear war. The logistics of a cold war requires economy of force. Logistics readiness, both for conventional warfare and for nuclear warfare, and a healthy economy are required for the long-range economic-political struggle.

The structure of war consists of a group of general factors; political, economic, geographic, military, psychological, scientific, and technological. All these factors are interrelated, and there is no sharp division between them. Among them, the military factors[26] consist of strategy, logistics, tactics, intelligence, and communications. These military factors are based on the general factors and all the factors are interrelated. The dominant factors are strategy, tactics, and logistics. Every war situation is a blend of strategical, logistical, and tactical considerations [Ref. 14].

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[26]The military factors described briefly in figure 4.1 are reproduced from [Ref. 14 pp. 24].

Strategy	; determines the objective and broad methods for attainment.
Logistics	; provides the means to create and to support combat forces and weapons.
Tactics	; determines the specific employment of forces and weapons to attain objectives of strategy.
Intelligence	; Shed light on the situation.
Communication	; transmits information and decisions

Figure 4.1 Brief Description of Military Factors.

Some types of strategic and logistic interrelations by Henry E. Eccles [Ref. 14] are;

1. Scope and timing of strategic plan
2. Composition, balance and deployment of forces, force build-up
3. Strategic overseas base site selection build-up
4. Critical logistic element
5. Maintenance of political position without war
6. Strategy of blockade, national economics, critical logistic targets.

Henry E. Eccles stated that strategy is the comprehensive direction of power to control situations and areas in order to attain broad objectives.[27] Strategy and destruction are not synonymous, strategy uses destruction only when there is no better way to attain control [Ref. 14].

As we discussed in previous chapters logistics is the bridge between the economy of the nation and the tactical operations of the combat forces. An effective logistics system must be in harmony on the one hand with the economic

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[27]Figure 4.2 is reproduced from [Ref. 14 pp. 26].

Strategy is comprehensive.
Strategy is direction of power
Strategy is aimed at control
Strategy is always thinking of objectives

Figure 4.2 Nature of Military Strategy.

system of the nation, and on the other hand with the tactical concepts and environment of the combat forces. This principle of harmony explains why a single logistic system can't successfully apply identical procedures to the support of ground, sea and air forces. Differences in the tactical concepts and the tactical environment create different needs for logistics support organizations. Economic factors limit the combat forces which can be created, logistics factors limit the combat forces which can be employed [Ref. 14].

This relationships between strategy and logistics will be explained further by investigating the impacts of logistics on strategy.

B. THE IMPACTS OF LOGISTICS ON STRATEGY

Andrew J. Ogan tried to explain the importance of logistics in his article [Ref. 16]. He stressed the importance of logistics in the air force point of view, but we can think of it in a general military point of view.[28]

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[28]Most of the contents of the following sections are from [Ref. 16] with some additional comments, they are not the opinion of the author of this thesis.

1. Logistics Determines Military Capability

Regardless of the definition of military capability, the logistics system determines the capability of each individual weapon system. While that statement is accepted as fact within the logistics community, there is a great deal of skepticism among strategists and tacticians. The logistics system determines whether a weapon system possesses any actual military capability at any given time as well as what the character or nature of that capability may be. As an example, if we consider the impacts of fuels, munitions, and spares on a weapon system, no weapon system can perform any designed mission without fuel to move to the theater. The lack of munitions may prevent the performance of the interdiction assigned to the weapon systems. And even if both fuel and munitions are in plentiful supply, the lack of spares may prevent the weapon system from even leaving its initial position. What the logistics system provides in terms of both the types and the quantities of resources determines the nature of the capability for weapon system and the entire operating theater. It is this control that makes logistics such a dominating influence in the successful employment of strategies and tactics [Ref. 16].

2. Logistics Determines Tactics

While the tacticians plan the battlefield, the logistics system determines where and how the field units fight. Both the level and type of fighting are logistically constrained. The capacity of the logistics network to acquire and push resources into the theater controls the level of conflict. The type of fighting is, also, logistically controlled by the kinds of resources shipped into the theater. Operations may be delayed or dropped, not for insufficient capacity, but because the unique resources

required tc support cperaticns were not available. There is ample evidence to suggest that logistics has, in fact, greatly impacted tactics ir past conflicts. As a recent example, in Vietnam, the front-line-forces faced rescurce movement difficulties. While there were adequate stocks moving to the theater, insufficient port facilities and distributicn resources inhibited redistribution in the theater [Ref. 16].

Icgistics alsc determines the fighting opticns cpen to a ccmmander by the type cf support it can offer. In Vietnam again, air pcwer acticns were substantially reduced due tc lcgistical constraints. Tactical changes called for the use cf specified munitions for the mission. Air power acticns were curtailed until sufficient quantities of the specified munitions could be located and shipped tc the theater by special airlift.[29]

3. Iogistics Determines Strategy

Strategy determines the battlefield tactics. At its center, strategy encccmpasses two unique levels that are bcth logistically dominated. An overall or grand strategy is directed tcward the development of the forces necessary to support national goals. Once the decision has been made to fight, hcwever, a wartime strategy broadly defines the cbjectives required to sustain military operations until a particular conflict cr action can be favcrably resolved. Under each level, logistics establishes the basis for success. The overall strategy can be best considered as a preparatcry stage taken before a conflict arises or the decisicn tc enter it has been made. This level of strategy encompasses the develcpment of two main objectives ; (1). The ready units to support national objectives, (2). The

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[29]Fcr mcre examples, see [Ref. 16 pp. 21].

structure to support this units over prolonged periods of time. Overall strategy is synonymous with two commonly used terms - readiness and sustainability [Ref. 16].

Readiness entails the maintenance of both hardware weapon system and the personnel. This means that both rely on an effective logistics system. The readiness of the weapon system depends on the ability of the logistics system to acquire sufficient resources to maintain them in operational status. The logistical problems associated with fuels and munitions have impacted not only the weapon system readiness but also the proficiency of the crews who must operate them. Training missions have been reduced both in terms of quantity and quality. The fuel shortages have restricted the number and types of training missions [Ref. 16]. This oil-shortage problems faced by non-oil-producing countries such as Korea might influence the military training more than expected by oil-producing countries, especially for the weapon system operating vehicles.

Overall strategy also includes the sustainability of those units that are committed to a conflict. Again the logistics system determines the success of any prolonged military effort. The industrial base controls the projection of military power. Industrial planning is essential to ensure the availability of sufficient capacity and materials to meet the resource requirements of war. To change the industrial base and its impacts on sustainability will require many years of adjustments and redirection based upon a national sense of need and a strong commitment. The wartime strategy establishes the overall objectives of the conflict and identifies the individual steps necessary to achieve them. To this area, logistics is a critical, almost overriding, consideration in the three primary applications of wartime strategy, i.e., force movements, force reconstitution, and force direction. To support the movement of

forces, logistics must be involved because overall victory can only be sustained with resources [Ref. 16].

We can see the impacts of logistics on strategy by the following examples. The Normandy invasion established a firm base for the destruction of the German Army and the liberation of Europe. It illustrates the integration of the strategic, logistical and tactical planning. It also illustrates the problem of the composition of balance and deployment of combat and logistic forces. The Normandy landing was delayed one month to allow time for strategic build-up. The Southern France landing was delayed two months because of critical logistic element - the availability of landing craft. Every WWII Pacific amphibious landing illustrates this relation between strategy and logistics. The results of those landings was a successful strategic drive toward the enemy homeland and the destruction of the enemy bases, his fleet and his air force. They illustrate the problem of overseas base site selection and the logistic build-up along a line of strategic advance.

C. LOGISTICS AND STRATEGY FLEXIBILITY

The availability of any particular weapon should not determine the strategy to be used. Strategy must have at its disposal a variety of weapons and forces so that particular combination must suitable to the situation as it actually arises, may be quickly formed, and swiftly and decisively employed in the appropriate manner. [Ref. 14].

Flexibility comes initially from the perception and character of the commander. It comes from sound strategic and tactical concepts, and variety of weapons appropriate to the nature and degree of control that you wish to establish. It means that there must be mobility of forces and there must be a flexible organization. The logistic support must

be responsive to strategic and tactical command needs, and that means there must be responsive logistic resources and a transportation system which is responsive to the immediate needs of operational commander [Ref. 14].

Strategy flexibility has its primary sources in the competence, perception, and character of high command. While other factors are also important, sound logistic concepts and a sound logistics system provide the physical base for strategic flexibility. This means that logistics system must be studied from the perspective of high command, and it also means that commander must understand logistics. The perspective of command is that point of view which knows the nature and relationship of the technical problems of commands, which recognizes how they affect its capabilities, and which understands the amount of time and effect required to solve these problems. Logistics will always limit strategy and operations, and since, when one logistic limitation is overcome, another limitation will takes its place. A command must always be sure which logistic factors are exercising their limiting influence in any particular strategic or operational plan he is carrying out or contemplating. Logistic support may be considered inadequate by a timid or mediocre commander, but it may be adequate for a bold and competent commander who understands the nature and sources of flexibility, provided he has adequate command control of a flexible logistic system [Ref. 14].

In general, logistics plays a vital role in the attainment of strategy flexibility.

D. THE ROLE OF COMMAND AND ITS STAFF

Even though all military factors discussed in the previous sections were considered completely, if the commanders of each level of military field can't meet their

role or responsibility properly, the result of any conflict may not be the desirable one. Therefore, some more comments on the role of command and its staffs might be required for better performance in relation to strategy and logistics.

1. The Role of Commander

The most important element in war in the past has been the mind of commander, and this will continue to be true in war today or in the future. Henry E. Eccles stated that commander transforms war potential into combat power by its control and use of the logistic process. Thus wisdom in high commarder requires a knowledge of both economic factors and of logistic factors [Ref. 14]. Henry E. Eccles also argued in a lecture delivered at the Naval War College that the commander must know the tasks, the problems, and the challenges of his technical specialists. He must be able to reconcile the contradictions which inevitably arise. He must be able to compensate for deficiency in one area by action in another, and must be at times willing to sacrifice one or more special interests in the higher interests of the overall objectives of the command, and this is not a simple task [Ref. 15].

A sound concept of strategy is the foundation for all high military thinking. The higher the the level of thought, the more strategy and logistics tend to coalesce. A sound strategy must be the essential element of all high military thinking. At the highest level of command, commander is concerned with the economic-logistic influences and their limitations on strategic decision. As the level of command descends, these limitations and influence tend to shift to the purely logistical, and they limit and influence the immediate employment of specific combat forces [Ref. 15].

The mind of civilian commander is concerned primarily with economic influences and limitations, however, the mind of military commander is concerned primarily with operational logistic influences and limitations, although it must consider in the economic field as well. But, the chief point is that both civilian and military commanders must be aware of these influences and of these limitations, and must understand the shifting relationships in the exercise of control [Ref. 14].

2. The Responsibilities of Staffs

For effective operations, it is necessary to integrate the strategies and logistic planning.

Basis for Plans	Logistics
Objective or Mission	Time-phased logistic require-
The Forces Involved	ments both to create and
The Scheme	support the combat forces.
The Intensity of Action	What? How much?
The Timing	When? Where ?

Figure 4.3 The Basis for Plans and Logistics.

As presented in the figure 4.3, the basis for plans is the objective or the mission, the forces involved, the scheme of maneuver, the intensity of action, and the timing. All this must related to the geography and to the availability of combat forces.[30] From these factors, we can

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[30]Figure 4.3 is a simplified expression of the contents of [Ref. 15 pp. 33].

develcp time-phased lcgistic requirements both to create and to support the ccmbat forces. The concepts must ccme from the mind cf command. But in our complex technology cf tcday, the mind cf command must be supplemented by efficient and understanding staff wcrk [Ref. 15].

The staff responsibilities presented by Henry E. Eccles are expressed briefly in the figure 4.4. For this to be effective, the strategic-lcgistic discussions and thcught among the members of the staff in the logistics divisicr and in the operations division must be concurrent. The man who are doing operational and strategic planning must know

Operaticns states forces and schemes.
Lcgistics states probable shortages.
Operaticn and logistics jointly suggest modifications.
Ccmmand evaluates and decides.

Figure 4.4 The Staff Responsibilities.

enough about logistics so that their schemes are not absurd. In relaticr to these respcnsibilities, Henry E. Eccles strcngly argued that ;

> It is not the task of logistics divisicn to decide logistics feasibility. The lcgistics divisicn decides on the lcgistic requirements to support a scheme for operating ccmbat forces. It must know the state of logistic availabilities, and states to the commander what shcrtages tc expect under the scheme which he proposes. Cne of the tcughest of all ccmmand decisions is to decide this question of "logistic feasibility". It can't be passed tc a logistics divisicn except in cases where the mass of material, the complexity, and the lack of foresight have been so great as to result in a plan which is so cbviously bad that it can't come close to being supported [Ref. 15].

The logistics officer must always have the viewpoint of command. He must always seek to harmonize and reconcile conflicting technical interests in order to broaden the objectives of command. It is equally important for the commander to understand logistics, for if the commander doesn't understand logistics, logistics considerations will dominate his decisions, whereas if he does understand logistics, logistics considerations will influence his decisions.

V. LOGISTICS STRATEGY FOR ROK MILITARY FORCES

To investigate the logistics strategy for ROK Military Forces, it will be necessary to study the relationships between ROK and U.S., the realities in Korean Peninsula, the analysis of logistics problem, the alternatives to resolve problems perceived, and finally the logistics strategy for ROK and the U.S. foreign policy in relation to ROK.

A. THE RELATIONSHIPS BETWEEN ROK AND THE U.S.

Thirty three years ago, on June 25, 1950, North Korean troops invaded the South Korean Republic. The U.S. and other nations, under the jurisdiction of the United Nations, intervened to halt and push back this attack and reestablished the integrity of the Republic of Korea (ROK) roughly along the lines of partition which were in effect at the end of WWII. During this war period, 1950 - 1953, there were 136,528 military casualties from the U.S., over 15,501 military casualties from all U.N. participants, and about 843,572 South Korean military casualties.[31]

In the intervening years, the U.S. has acted as the primary guarantor of South Korean's integrity under the charter of the United Nations. The U.S. since 1953 has exercised both international responsibilities and national interests in maintaining a military presence on Korean Peninsula. Over the years, this investment of U.S. forces has come under sporadic questioning, and there have been repeated proposals for reducing or withdrawing U.S. forces from the peninsula. During the Nixon Administration, an

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[31]See table II, for more detail casualties both friendly and enemy forces.

TABLE II

Estimated Casualties of The Korean War

1. United Nations Forces.

Countries	Dead	Wounded and Missing	Total
Australia	265	1,387	1,652
Belgium	97	355	452
Canada	309	1,235	1,544
Colombia	140	517	657
Ethiopia	120	536	656
France	288	836	1,124
Greece	169	545	714
Netherlands	111	593	704
Newzealand	31	78	109
Philippines	92	356	448
ROK	415,004	428,568	843,572
South Africa	20	16	36
Thailand	114	799	913
Turkey	717	2,413	3,130
U.S.	29,550	106,978	136,528
United Kingdom	670	2,692	3,362
Totals	447,697	547,904	995,601

2. Communist Forces

China		900,000
North Korea		520,000
Total		1,420,000

*Source : Robert Leckie, "Conflict", The History of Korean War 1950-1953, G.P. Putnam's Son's, N.Y. 1982, PP. 429.

infantry division was pulled out. In 1977 President Carter proposed a total withdrawal of ground forces from Korea, but this decision was first delayed and then was rescinded in 1981 by political change in Washington and military realities in Asia [Ref. 17].

The motives for the announced pull-out as stated by Ernest W. Lefever [Ref. 18] seem to relate a desire to

normalize relations abroad and a determination to avoid U.S. involvement in another Asian conflict, as well as to secondary considerations including alleged defense savings, recovery of the U.S. image dimmed by Vietnam , encouragement of South Korea self-reliance.

The U.S. has been involved successfully in a limited war in Korea and unsuccessfully in a limited conflict in Vietnam. Lefever stated that the motive of avoiding embroilment in a new conflict on the Asian mainland (or anywhere else, for that matter) is understandable. Yet, the avoidance of involvement in possible war can hardly be the only U.S. objective or responsibility. The U.S. bears a solemn treaty obligation to defend the ROK against aggression or conquest by the North.

Korea is the one area in the Pacific Basin where the interests of the four major regional powers - Japan, Communist China, the USSR and the U.S. - intersect directly and significantly,and Korea is vital to the security of Japan and crucial to the entire U.S. position in the western Pacific. A removal of U.S. military force might consign the U.S. to a minor role in North Asia, with incalculable consequences for the regional power balance and U.S. interests. The global defense commitments of the U.S. are ever more contingent upon the contributions and close cooperation of allies [Ref. 18].

The U.S. may not shrink from conflict if and when its vital interests are challenged. But, we must consider the Congress and public opinion when active war occured in any place in the world. If an active war occurs in Korean Peninsula and the U.S. decide to pull-out its military or ground forces according to the decision of the Congress or according to the public opinion, then the impact of the decision on Korea and Asia more generally would be profound.Even though, the ROK and the U.S. think that the

U.S. would not pull-out its ground forces during an active war - but, probably during peace. Lefever outlined the following possible contingencies,[32] and if any one of which materialized, it would jeopardize the U.S. interest in peace and stability in Asia and the Pacific.

1. North Korea, with Soviet encouragement, might accelerate its military build-up as it did after the withdrawal of 20,000 U.S. troops from the South Korea in the early 1970s. This build-up could culminate that the U.S. would be in the final analysis steer clear of a new conflict on the periphery of Asia.

2. Sensing the decline of America power in the region, the Soviet Union might become more active politically and militarily, expecting that a unified Korea under its aegis would strengthen its position against China and vis-a- vis Japan.

3. Japan might lose confidence in the U.S. security commitment and gradually be forced toward comprehensive accommodation with the Soviet Union, China or both.

4. China, apprehensive of Soviet moves in the wake of a perceived diminution of the U.S. commitment, might be emboldened in its efforts to take over Taiwan by conquest or other means.

5. Fearing complete abandonment by the U.S., South Korea might press rapidly the nuclear capabilities of its own as a substitute for the vanishing U.S. deterrent .

6. Feeling more threatened, in secure and vulnerable to internal subversion and external attack, the political situation of South Korea may be sterner than before.

7. The Republic of China, anticipating a total abandonment by the U.S. in the wake of Korean withdrawal as well as an accelerated U.S. quest to normalize relations with Peking, might chart a more independent course, including the development of an independent nuclear deterrent.

8. The Philippires, already demanding what amounts to ransom from Washington as rent for two U.S. military bases, Clark Field and Subic Bay, might deny these base rights to the U.S.

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[32]See [Ref. 18 pp. 34].

In addition to these contingencies by Lefever, we should consider two more factors; (1). The ROK would not be abandoned completely by the U.S. or by the allied countries, because of the importance of the ROK in relation to its location. (2). Recently, the relationships between the U.S. and PRC are becoming more friendly than before, and it will, to some extent, help the maintenance of the peace in Korean Peninsula.

In 1981, the Reagan Administration halted the withdrawal of U.S. ground forces (the 2nd Infantry Division) and is in the process of modernizing both its ground and air components on the peninsula. More important, Secretary of Defense Weinberger committed the U.S. to the continued support of ROK Force Improvement Program (FIP), which envisions continuing investments of upwards of $1 to 2 billion a year on research and development and acquisition of appropriate programs. The ROK has merited the status of a strong and faithful ally, and has staged over time significant contributions to its own defense with the help of the U.S.. Particularly, the ROK military participated in the Vietnam War. These contributions will continue, and the ROK's forward defense wall can be shared up against the rising offensive capabilities of a determined opponent. However, improvements are needed, since there exist power imbalance between the ROK and the North Korea as stated in [Ref. 17]. This will be discussed in detail in the following section.

B. THE REALITIES OF KOREAN PENINSULA

1. North Korean Military Force Build-up

Recent assessments[33] have traced a remarkable growth in North Korean military power in ground, naval and air forces as well as unconventional warfare capabilities. What has made this growth all the more disturbing is that it unfolded during a period when North Korean's, Kim Il Sung, professed to be steering a course of peaceful industrial development for his country and rapproachment with the ROK. The assessment suggest that North Korea today not only is the clearly super military power on the peninsula, but commands the third or fourth largest communist army in the world, following PRC and the Soviet Union (and roughly equal to that of Vietnam). A starker comparison is that the North Korean Army is almost as large as the U.S. Army. This staggering military build-up reflects a huge investment of resources. Some western analysts estimate that North Korean now allocates about 20% of its GNP to defense, and it means that this small country of about 18 million people now makes the largest per capita expenditure on defense of any country in the world except Israel [Ref. 17].

The gains in the strength of the North Korean ground forces are presented in table III for ten years of comparison.[34] It shows that the size of North Korean Army has doubled to at least 700,000 men. Its inventory of tube artillery similarly has undergone a twofold increase, while the number of multiple rocket launchers has tripled. Its armor-tanks and personnel carriers - has multiplied by a

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[33]See [Ref. 17 pp. 64-66].

[34]Table III is reproduced from [Ref. 17 Table 1 pp. 65]. For more detail estimates of strength of the North Korea, see "North Korea - A Country Study", Area Handbook Series, by Headquarters, Department of The Army, DA Pam 550-81 Supersedes1976, Third Edition, PP. 257- 261.

TABLE III

North Korean Ground Forces (1970 - 1980)

	1970	1980
Personnel	350,000	700,000
Artillery(tube)	2,200	4,100
MRI	700	2,000
Tanks/Assault Guns	900	2,700
APC	100	1,100

factor of three and ten respectively. These huge force increases were staged after Kim Il Sung announced in 1969 his policy of peace and reconciliation with ROK. Intelligences now suggest that all new North Korean armor comes from domestic production, and some analysts purport that North Korean factories produce 300 to 400 tracked vehicles per year [Ref. 17].

2. ROK and North Korea Force Comparison

The impact of North Korean military build-up on the regional balance can be seen in Table V. The U.S. and its allies in the Pacific once drew comfort from the fact that the army of ROK substantially outnumbered its counter part in the North. This relaxed view of the balance on the Korean Peninsula prompted President Nixon to remove a U.S. division in 1971. Table IV shows that today the numbers in all categories favor the North Korea, but even those figures don't tell the full story of the relative combat potential of the two sides.[35] Cotter and Winker compared the military

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[35]Table IV is reproduced from [Ref. 17 pp. 65] and [Ref. 18 pp. 29].

TABLE IV

ROK and North Korea Force Comparison (1980)

	ROK	North Korea
Total military forces	2,340,000	1,635,000
- Regular forces	500,000	635,000
- Para-military	1,840,000	1,000,000
Artillery(tube)	2,800	4,100
MBI	0	2,000
Tanks/Assault Guns	1,000	2,700
APC	500	1,100
Aircraft	335	630
Ships	177	290
Submarines	0	10

forces of ROK and North Korea [Ref. 17]. Both the ROK and North Korea have formidable military establishment. A combination of military, political and psychological factors, however, gives the North the edge, despite the ROK's larger population, much larger GNP, and greater productivity. The North is largely equipped by Soviet Union, and the ROK by the U.S. The disparity of the artillery capabilities are a particularly significant part of the picture because the supressive capabilities and survival of ROK artillery will bear centrally on the ability of North Korean forces to breach the forward defense concept of the U.S. and ROK. The ROK today is sharply handicapped by the fact that more than half of its artillery is substantially inferior in both range and supression to that which would support invading North Korean echelons. Similarly, deficiencies apply to anti-armor systems. Many of the anti-tank weapons in the ROK

are mounted on jeeps and don't have the protection to survive and operate in the expected supressive environment [Ref. 17].

Lefever analyzed that the superiority of the North in manpower, aircraft, tanks and ships is sharpened by two other factors ;

(a). The significantly larger periods of military service required by North. (b).Pivotal in the North's advantage, however, is the political and military orientation of North Korean forces, which are configured more for attack than defense, while the reverse holds true for the forces in the south [Ref. 18].

TABLE V

Periods of Military Service

	ROK	North Korea
Army	2.5 years	7 years
Navy	3	5
Air force	3	3 - 4

The Korean Peninsula covers a small area; the ROK itself is about the size of Florida. But, two of the largest field armies in the world now confront each other in that narrow space, ready for combat on short notice. The danger from the North is underscored by the extensive invasion tunnels dug under the DMZ, ambushes of U.S. and South Korean soldiers, subversive efforts, a constant stream of bellicose propaganda from Radic Pyongyang and provocative incidents such as the Rangoon bombing as a recent example.

The military advantages of the North are redressed today by the presence of U.S. military forces in the South and the nearby Seventh Fleet. For 24 years there has been stability on the Korean Peninsula, thanks primarily to the presence of U.S. forces in the South [Ref. 18].

3. Expected War Scenario and Operational Imperatives for ROK

a. Expected War Scenario by the North Korea

After studying the model of the Soviet Union and the Korean conflict, Cotter and Winker constructed a concept of operations that the North Korean might plausibly follow.

(1). It is clear that a new North aggression would aim at the objective of bring about the rapid political collapse of ROK and the quick occupation of all of the peninsula before the U.S. could substantially respond with air, ground and naval reinforcements.
(2). The existing North Korea force structure permits a campaign along the following simultaneous fronts.

(a). A massive ground and air attack across the DMZ.

(b). The temporary isolation of the Peninsula.

(c). Attacks on key facilities throughout South Korea.
(3). The Ranger Commandos will execute operations through the depth of country.
(4). The isolation of the peninsula requires the mining of port facilities and the knocking out airfields and key communication centers [Ref. 17].

But, by far the major concern of ROK defense focuses on the improvement of the forward defense system so as to cope with a massive air/ground attack across the DMZ.

b. Operational Imperatives for ROK Defense

Cotter and Winker further noted that an attack by echeloned forces, featuring the skillful use of its capabilities for fire and maneuver, can be devastating for an

ill-prepared defense, and there is obviously a number of ways in which a defensive system can be organized, but in ROK the choice is narrowed by the imperative of a defense that is well forward. The basic doctrinal framework for a modern forward defense has been reformulated by the U.S. Army.

(1). It specifies the way air-supported corps, divisions and brigades shall deal with an attacking echelored force.
(2). In the case of North attack, infantry will be on the first echelon, with armored divisions in the 2nd, and perhaps the third echelons.
(3). The fundamental problem facing a forward defense is how to deploy and operate a system that can find and target these echelned forces far over the horizon while the central battle is in progress [Ref. 17].

Cotter and Winker stated in their article that ;

In the event of new aggression, U.S. and ROK forces will not be limited to the objective of restoring the status quo ante, as happened in 1953. Rather the aim will be to achieve the military advantages that can ensure a more stable territorial settlement. Consequently, for political as well as military reasons, a strong counter-offensive is an integral part of any forward defense in Korea. The key physical capabilities required for a forward defense are;
(1). Over the horizon surveillance. (2). Delivery systems with appropriate munitions. (3). A command structure, supported by communications, which allows the integration of all sources of information and its rapid distribution to appropriate maneuver, fire support and air elements.

In line with these requirements, the responsibilities of the defense system might best be distributed as follows;
(1). The brigade commanders are concerned with the assaulting infantry regiments and the Ranger Commandos. (2). The division commanders deal with the second-echelon infantry regiments. (3).The corps commanders handle the second- and third-echelon armor and mechanized divisions.

The primary weapons against the infantry and its echelons will be artillery, while the brunt of the task of disrupting and destroying the armored and mechanized divisions will be carried by U.S. and ROKAF [Ref. 17].

To summarize the success of a forward defense in Korean hinges on several related capabilities. The defense must be able to see, track and thereby determine the intension of each echelon of the attacking force. They should, if necessary, be able to bring ordnance to bear on all echelons in amounts that disrupt (or preferably destroy) them before they can approach the forward line of troops. Thus, the battlefield is extended inward into enemy territory. Attrition of the enemy's forces is exacted directly and on his own soil. When the initial assault is blunted and the enemy echelons are disrupted, a vigorous counteroffensive can be launched into North Korean territory through the use of air, artillery and maneuver forces [Ref. 17].

c. Some Needed Hardware Components

Cotter and Winker analyzed some needed hardware components that are required by the ROK and U.S. forces in Korean Peninsula. The key requirements for the U.S. and ROK for over-the-horizon surveillance in Korea can be met by exploiting the rapid advances in electronics, such as electro-optical cameras, ground surveillance radars, receivers that look for electric emiters, as well as other sensors that can be carried in manned and unmanned aircraft or positioned on the ground [Ref. 17].

Direct- and indirect-fire weapons are needed to redress the force ratio and force density imbalances that now favor the potential aggressors in Korea and to provide the capabilities to carry the battle into enemy territory. These material improvements can be grouped into 3 broad categories [Ref. 17] ;

(1). Survivable direct weapons. (2). Survivable artillery. (3). Air- to- ground dispensers carrying area munitions for use against armor, airfields and other facilities.

The present imbalance in anti-armor can be overcome by increasing the number of anti-tank missile systems in the hands of ROK forces by a factor of two to three, placing them under protective armor and on helicopters for rapid use against breakthrough concentrations. The North Korean army is formidable, but its assaulting infantry requirements are highly vulnerable to anti-personnel munitions. The U.S. Army has developed and is now producing this ammunition and the means for delivery. The replacement of 105mm artillery with the 155mm piece should correct the current imbalances in artillery capabilities. The present capability of U.S. and ROK Air Force to destroy echeloned armor needs improvement [Ref. 17].

This discussion of improvements is by no means complete, having focused only on the more essential items in the U.S./ROK inventory modernization. The basic thrust of the foregoing, in any event, has been to demonstrate that Korea is one potential battlefield where imbalances in conventional capabilities in favor of the potential aggression can be corrected by the selective infusion of technology that is available on the shelf or in late stages of development. But this infusion must be tailored to a comprehensive and integrative concept of operations that is keenly sensitive to the potential enemy's operational code and its inheritant vulnerabilities [Ref. 17].

C. DEFENSE STRATEGY OF U.S. IN RELATION TO KOREA

General John J. Hennessey (USA) stated that the primary U.S. defense objective is deterrence and international stability.[36] U.S. deterrence policy has employed a total force concept embracing its allies, as defined in the Nixon Doctrine [Ref. 21]. U.S. national policy remains based on

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[36]See [Ref. 19 pp. 44].

the principle that war is an unacceptable means of settling disputes among nations. U.S. still believe in deterrence, in discouraging conflict from a position of strength. It makes sense and has been successful when effectively applied [Ref. 21].

General Jack J. Catton (USAF) stated in his article [Ref. 21] that the total force concept is a force to maximize the free world force available to meet a contingency. Added to U.S. own active duty and reserve forces are those free world forces - allies - who will join U.S. to meet a shared threat. The definition of the total force tends to be an enumeration of how much hardware and what systems, in what quantity and quality, are needed.

General Hennessey stated that;

> As part of overall deterrence capability of the U.S., the U.S. must demonstrate a clear and evident capacity and resolve to fight, either alone or in concert with allies, at any level of conflict, conventionally or with nuclear weapons, so that any potential adversary will assess his own risk to be unacceptable. Specifically, the U.S. must maintain a clearly-perceived equivalence in nuclear forces vis-a-vis the USSR. Concurrently, U.S. must maintain the ability to deter the use, or threat of use, of conventional forces against the U.S., its deployed forces, its allies or other nations considered vital to U.S. security or interests [Ref. 19].

Because the U.S. has neither the manpower nor the military resource to counter unilaterally all military threats to its own national interests or the collective security provided through regional security agreements or through bilateral treaties with individual allies or friendly nations. U.S. provided economic and military assistance to friendly nations, and they in turn support forward-deployed U.S. combat forces in times of hostilities or threats of hostilities [Ref. 19].

The U.S., with its strategic nuclear forces alone, can't deter all contingencies which could affect the interests of

it. For many situations, non-nuclear forces must bear the main burden of deterrence. As have been demonstrated many times since WWII, strategic nuclear forces alone can not guarantee peace or international stability. Essentially, there is a continuing need for a U.S. military strategy that maintains a strong defense capability even though its current relationship with its principal adversary is less than belligerent and hostile [Ref. 19].

General Catton emphasized the role of logistics in policy and strategy, especially for current U.S. deterrence defense policy. He stated that ;

> There is a tendency to neglect the importance of logistics, a misunderstanding which, when allowed to persist, threatens the effectiveness of total force. Too often in limited funding, the money also follows this neglect, which might result in inadequate financing for the support function. Only responsive logistics gives meaning to realistic deterrence, and thus we must recognize that the force which performs the function of supply and maintenance contributes to this nation's overall deterrence posture. The logistics of deterrence recognizes that when the enemy planner sits down to assess our forces, he values only those which the logistics system has ready or can get ready in time and sustain. Today's national policy calls for strength, partnership and willingness to negotiate. All are interrelated but draw their efficacy from strength which demands and receives a second logistics base [Ref. 21].

The total force policy calls upon mutual support by active and reserve components of U.S. military forces and the military forces of friendly nations. Forward defense is complemented by U.S.-based strategic reserve and strategic military forces. U.S. military strength and the world's perception of that strength are fundamental to deterrence and the maintenance of world stability. The operational readiness of U.S. forces is the essential key if the U.S. military strategy is to be effective and credible [Ref. 19].

As many authors and generals mentioned in their articles, the U.S. has a deterrence defense policy. The ROK is one of the most important allies. Thus it can not be denied

that ROK is vital to U.S. defense strategy, but there exist many problems that must be solved on a short- term basis and on a long-term basis.

D. LOGISTICS STRATEGY FOR ROK DEFENSE

1. The Problems of ROK Military Logistics

a. Difficulty of Sustained Logistics Support

Brigadier General Winfield S. Scott, USA (Ret.), stated that ;

> Very few countries have a sustaining logistic support capability. There is nothing threatening about basic logistics, therefore this type of commodity is not too attractive to the leaders of allied countries who want to improve their defenses. They are aware of the fact that sustaining logistic support is expensive in dollars, manpower, education and time, and the more sophisticated the weapon and its capabilities, the greater the need for effective logistic support in the event of hostilities [Ref. 20].

As Scott mentioned above, the ROK does not have the sustaining logistics support capability. In recent years whenever hostilities have erupted in the Middle East they have been of relatively short duration because of the lack of sustaining logistic support on both sides. None of the antagonists have had the combat consumables for the long haul, thus making them dependent on the outside world for support in the long run [Ref. 20]. ROK military leaders may not concern themselves with support other than initial support because the key to success in the event of hostilities is surprise and a short war, which is terminated before the U.S. have time to react. Once the U.S. does react, it controls the pace of warfare with its follow-on logistics unless the North Korea is militarily superior to the South Korea and can end things quickly. The U.S. has to decide whether or not it is to its advantage to provide combat

forces or support forces or both. If the U.S.combat forces are provided, there is always the possibility that the USSR or China will also commit its combatants.

b. Maintaining Operational Readiness

General John J. Hennessey stated that ;

> Military strategy and readiness are so closely related that they can not be separated. Readiness encompasses such diverse things as the positioning of men and materiel at strategic locations, the maintenance of a high level of operational capacity and preparedness in both active and reserve components, and the maintenance of adequate logistics capabilities to sustain combat. It can be misleading and dangerous to use the word readiness in place of the deed. It would be pointless to spend billions of dollars for weapons, equipment, war reserves, airlift and sealift, if we did not have the ability to use them to the fullest if required. Maintaining operational readiness involves; Deployment planning, unit training, contingency planning [Ref. 19].

As General Hennessey noted above, the ROK military personnel should have the ability to use the weapons, equipments, and any kind of logistics hardware components which will be given to the ROK military forces at the time of hostilities. Even though the ROK military forces can get the weapons which have excellent capabilities, either from FMS program or grant aid of the U.S., if the ROK military personnel has no capability to use them effectively and efficiently, they will be useless. Therefore, what is needed for the ROK military forces is that at least the logistics personnel should be trained to teach the field users how to use the specific weapon system in a short period of time, and to avoid the undesirable process of teaching. The U.S., if it has any plan to give weapon system support, should give them as soon as possible, not later or at the emergency. What should be done by the ROK military leaders is that; if they have any plan or schedule to get better weapon systems, they should do it as soon as

possible, in order to help the operational readiness of the ROK military forces.

c. Logistics Strategy for the Future

Colonel Harry L. Gregory, Jr., USAF, stated that;

> It is readily apparent that UASF lacks a viable logistics strategy to meet the future. Instead of a single integrated and integrating set of ideas, beliefs, and concepts, we have had a complex and sometimes contradictory melange of notions. Little changed since WWII, our current support concept has failed to adapt to environment dynamics. The evolution of technology on the modern battle field has confronted strategy with the realities of finite resources ; at least one logistics factor will always impose limits on a military force. A new framework for logistics support, a logistics strategy, is needed to ensure full realization of war-fighting potential from available resources. [Ref. 22].

We can think of the problem argued by Gregory as addressing the ROK military forces. At any time, the ROK military forces must have the ability to cope with any kind of hostilities of the North Korean military forces, but as we have already seen in the previous chapter, ROK military forces are inferior to the North Korean military forces. Therefore, if there is no U.S. ground force in Korean Peninsula , the stability of ROK might be in danger. Furthermore, the ROK should analyze the capability of U.S. military forces whether or not it can provide combat forces in case of North Korean hostilities. After analyzing the possibility of provision of the U.S. combat forces, ROK military forces must have contingency planning which the ROK forces alone can cope with the North Korean hostilities, or can do it with U.S. logistics support only.

d. Knowledge about Logistics

Knowledgeable logistics leadership, guidance, and policy are necessary to create a single logistics

operation focused on attaining the correct objective, military capability. No military force can be entirely effective in carrying out its mission, no matter how outstanding it may be, without logistics. The complexities of military logistics are such that persons appointed to senior management positions who don't possess a depth of logistics experience and understanding can't provide effective leadership to this multifaceted operation in the near term.

What makes this problem worse is that most officers, especially young competent officers, want to be on the commanding line. They don't want to be supply officers or logistics-related staff officers. This problem is not only the property of the ROK military officers, it may also occur in the U.S. military. There may be many reasons why they avoid being the supply officers. One apparent reason is the promotion opportunity. In other words, the promotion rate of the operational field is higher than the logistics field, especially in The ROK Army. It may also be true in other services of ROK military.

e. Logistical Realities of ROK Military Forces

While strategies and tactics are quickly adopted to changing situations and objectives, the logistics system is a large and a complex process requiring complete and careful management to make any sufficient changes in objectives or results.

Given this environment, it should be understandable that changes may require years to institute. Any external change that affects the production base, the quality of repair, or the transportation system can dramatically change the capability of the logistics network to support military forces. While weapon systems and their resource requirements have become more complex and expensive, the funding levels necessary to support these systems

have occasionally been reduced. This problem could be confronted by any free world nations which may be in economic recession. It requires the reduction of funding levels, especially in logistics field of the military. In this situation, we should consider any kind of alternatives for savings.

2. Alternatives to Solve the Problems

Before developing alternatives, we should recognize that Korea is the U.S. ally which has the highest possibilities of getting involved in trouble. In developing alternatives to solve the problems mentioned in the previous section, we can consider the alternatives which the U.S. may follow, because the U.S. policy in relation to the ROK military forces, especially in logistics field, has great impacts on the logistics strategy which the ROK military will follow. The possible alternatives which can be developed by the ROK military forces might depend on the types of support by the U.S. Therefore, we may need to develop the alternatives that the U.S. could choose, and then the ROK military forces could develop its own alternatives.

The first possible alternative is to provide military advisors, newer and better weapons, and the combat consumables such as ammunition and repair parts without sending logistics support troops. This was essentially the courses of action followed during the early stages of Vietnam war. Learning how to provide effective and sophisticated logistic support is an all but impossible task when undertaken concurrent with the deliveries of equipment, supplies and ammunition. Not only is war-time support of an army more difficult than peace-time support, there is also a need for a big expansion of the in-country logistic support system, particularly in the field of combat consumable equipment and supplies [Ref. 20].

The second possible alternative is to provide logistics support troops in addition to the first alternatives. Logistics support activities such as supply, maintenance, transportation, and particularly supply and inventory control require many specialists with diverse skills and experience working together as a team [Ref. 20]. Therefore, if the U.S. would not provide logistics support troops with the newer weapon systems, it might take longer time to obtain the skills required to maintain and support the ROK military forces. However, the second option offers a good possibility for the ROK military forces to get the ability of maintaining the most improved logistics capability in a short period of time.

It is apparent that the favorable option to the ROK is the second one, either in a peace time or in an active war. However, we may not be sure which option is the better one to the U.S.. Therefore, we need some analysis. This analysis should start from the analysis of the supportability of the U.S. combat force, because the U.S. logistics support policy to the ROK military may change according to the supportability of the U.S. combat force.

3. Analysis

a. Supportability of the U.S. Military Forces

We must recognize that while the U.S. Army had only two more divisions in 1968 than the sixteen it has today, total army strength has been cut in half ; 1.57 million men in FY 1968 to 780,000 men in Fy 1976. While some of this reduction can be attributed to the reduction of two divisions, the elimination of headquarters, change in organizational structure, and other improvements resulting in greater overall efficiency, most of the reduction has been at the expense of the follow-on and sustaining logistical

support forces [Ref. 20]. With such a cut back in logistical support forces, U.S. leaders of today face essentially the same situation that existed in 1965 when the Republic of Vietnam needed more help. The U.S. has only two real options then, and U.S. has only two now;

(1). Either the commitment of U.S. combatant forces to fight in another country's battle. (2). Or the unleashing of the nuclear arsenal.

The nuclear solution was never a viable one and the United States's devastating experience with the former has made this option almost as infeasible. The build-up of Army combat forces in Vietnam was completely dependent upon the rate at which logistic support units could be activated, trained and deployed. Logistic support units were not available in the active Army to support deployed forces. In Vietnam War, U.S. refused to activate reserves which included or organized most of the logistics units. If they had been available, they could have been sent to Vietnam to provide base (rear area) logistic support for the Army of Vietnam, and the U.S. leaders would have another option. This option would not only have enabled the Vietnamese high commard to convert many thousands of Vietnamese logistics troops to combat soldiers. It could also have reduced the need for U.S. Army units to become engaged in combat operations. It is very difficult to provide sustaining logistic support on short notice [Ref. 20].

There is one more factor that should be considered when we analyze the possiblity of providing combat forces of the U.S. in case of the North Korea hostilities. General Catton stated that;

> We must include the people as a vital part of the total force policy. Because of our democratic way of life - a government of, by and for the people - the national leadership must respond to the moods of our society - even if the moods are marred by misunderstanding. They appear to lack an understanding of the external threat,

> and appear indifferent to the need for an adequate response to the growing threat. This misunderstanding, if translated into national decisions, could seriously weaken our country's military posture. The military power of our opponent continues to grow. At the same time, we find many in American society reluctant to accept this fact and to respond with the resources necessary to maintain an America with sufficient military strength to execute our national policy. Future of the U.S. to maintain an adequate military posture would undermine allied confidence in our capability and willingness to fulfil existing international agreements. American do believe in peace and in the freedom and dignity of each human being [Ref. 21]

For the difficulty of providing U.S. combat forces to the allied countries, Winfield S. Scott USA (Ret.) suggested the strategics logistic command[37] in U.S.

> What is urgently needed to provide a real credibility for the United States's foreign policy is a strategic logistics command that could provide both initial and sustaining support on short notice. Then, should any of its allies become involved in hostilities and it were to the advantages of the U.S. to assist that country, the State Department could negotiate the necessary agreements whereby the strategic logistic command would take over all in-country base-type logistic support. This of course would release all able-bodied personnel in the allied country to fight. [Ref. 20].

It may be natural for us to think that the U.S. should consider the kind of alternative suggested in the previous section, if the U.S. wants to keep its leadership in the free world, and wants to help its allies which may be involved in difficulty. If this strategic logistics command came into being in the U.S., the ROK military should have some kind of organization that can work with its troops. Even if the U.S. military didn't have an organization similar to the strategic logistics command, the ROK military forces must consider a organization which can meet the role as a mediator between the U.S. and ROK military forces in case of unexpected hostilities by North Korea.

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[37]See [Ref. 20 pp. 73-75].

b. Requirements of Military Logistics

As we discussed in the previous chapter, the modern art of war is composed of three coequal, independent elements ; strategy, tactics, logistics. Proficiency within each element and comprehensive integration of all elements are prerequisite to success on the battle field. The evolution of technology in warfare has settled any question of the criticality of logistics. An effective fighting force is contingent on those forces which the logistics community can make available for combat and then sustain through the requisite period of conflict.

We are now confronted by a numerically superior enemy whose doctrine places foremost emphasis on surprise. He posses Ranger Commandos capable of seizing our aerial ports, communication centers, air base, and logistics facilities. Therefore, it will be necessary to protect the logistics facilities from the sudden attack of the Ranger Commandos.

Many worthwhile initiatives have focused attention on cost-effective analyses of a scenario so detailed that flexibility of the force to meet any unexpected contingency becomes questionable. Because of skyrocketing costs, extended production lead times, and increased complexity, modern weapon systems will be retained in the inventory for increasingly longer periods than was experienced in the past.

Fred Gluck stated that during peace times, military forces became the butt of social, economic, and political pressures which cause the establishment of secondary objectives. These objectives, although seemingly scurd, detract from available resources, create new priorities, and generally tend to shift the focus of military forces (logistics in particular) from their primary objective to those

secondary objectives. The enemy's perception of our military power, and therefore its deterrent effect on them, is based primarily on the tangible evidence of military capability provided by the logistics operation, rather than on any strategic or tactical plans proposed by the operational element of the forces. During peace time, planned strategies and tactics shape the requirements of military logistics. However, during wartime, military logistics limits and shapes the strategies and tactics that can be implemented through the amount and type of military capability it provides to the combat forces [Ref. 24].

Again for the ROK military forces, it looks like peacetime, but in fact it is a semi-war period. The military capability of ROK is inferior to North Korea, there is a urgent need to increase military capability of the ROK. If the required amount of military capability can't be created during the state of preparing for war, then the probability that it can be attained while waging war is significantly low, unless we are engaged in a long-lived, low-order, conventional war.

Therefore, again it is required to increase military capability, and to increase military capability of ROK, it should be weapons-oriented logistics concurrently with maintaining personnel-oriented logistics.[38]

The industrial base is absolutely critical to the continuing needs of military forces. It must be recognized that at any given point in time, when war may be initiated, the amount of military capability that can be created, and therefore the amount of military power that can be applied, is based on those resources currently possessed by the military, and not on what will be provided in the future by the industrial base.

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[38]Personnel oriented logistics includes food, shelter, clothing, medical, training,...etc. See [Ref. 23 pp. 16].

If we reexamine the Vietnamese War, the U.S. forces provided much logistic support to the Vietnamese forces, but they were not used effectively because of lack of training.

What is required today urgently by the ROK and U.S. military forces in Korean Peninsula is the practical training of currently existing weapon systems which can be given to the ROK military forces by U.S. military forces. And further, ROK needs continual assessment of military capability of its own forces compared to North Korean forces. If it will still be inferior to that of North Korea, the U.S. ground forces are required until the ROK military forces can wage the war.

4. Logistics Strategy for The ROK Military Forces

a. The Necessity for Understanding Military Logistics

The logistics strategy that should considered at first is the necessity of understanding the importance and true meaning of military logistics by high military officers. For this matter, Fred Gluck stated that;

> Within the military today there exists a major problem which can not be eliminated by additional defense spending. This problem is the failure of the DoD to fully understand military logistics and its significance to the primary function of the military forces. Deficiencies in the logistics environment steming from this lack of understanding directly impact the nation's military forces. These impacts result in ;
> (1). Defective organization structure, relationships, and responsibilities.
> (2). Dictative concepts.
> (3). lack of concentrated logistics objectives [Ref. 23].

To overcome these deficiencies, the followings[39] should be accomplished.

1. Military logistics must be viewed as a major segment of the military forces, and must be recognized as a branch of military science equal to tactics and strategy. Military logistics must be integrated across the military complex as an essential part of the management and the nation's military capability.
2. The current military logistics need transition from vintage WWII logistics to modern military logistics. The ROK can no longer afford to treat military logistics with some level of ignorance. The importances of strategies and tactics notwithstanding, modern military logistics is the basis of military power, i.e., the level and duration of war that can be waged by combat forces. Therefore, the effective and efficient operation of modern military logistics is critical to the safety and survival of the ROK. Modern military logistics must provide the assurance that concept, structure, focus, and management of military logistics are present and effectively aligned to provide for the needs of today's military forces in general and its combat forces in particular.
3. Successful implementation can not occur until the necessary knowledge and understanding of modern military logistics are provided to the field. Implementation requires that ;

   (a). Senior MND(Ministry of National Defense) officials must fully understand the true role, objective, and importance of military logistics in the present forces.

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[39]For more detail relevant to the U.S. military forces, see [Ref. 23 pp. 13-17], and [Ref. 24].

(b). From this newly formed understanding there must originate a single MND-approved concept of modern military logistics which will provide to the field, along with other information and guidance, a total view of military logistics within the MND (what it is, what it does, and what it seeks to achieve).

After these requirements are met, either the individual services or the ROK Army Logistics Command(AIC) can begin to shape and then to initiate the required transition to a modern military logistics operation. The keys to this effort are knowledge and understanding.

(1) Major Contents That Should Be Understood. To understand the role and significance of military logistics, the following scenarios must be understood.

(a). The possible objectives of military forces of any nation should be ;

1). Deterrence of war

2). Defend its nation from enemy's attack

3). Supporting national objectives

However, the primary function of military forces is to wage some level of war, when called upon. For Korea, especially in the present time, the required military function might be to deter war in Korean Peninsula and to support national objectives which may be continual growth, and finally to defend the attacks of present and future potential enemies.

(b). In order to accomplish ROK Military functions mentioned above, ROK Military Forces must always have a capability to wage some required level of war.

(c). In today's military environment, armed conflicts are waged by sophisticated weapons. Therefore, the capability to wage war is provided to the combat forces by the logistics environment (system) in the form of sustained operational weapons. Here we need the definition of military capability. Military capability, defined by Fred Gluck, is the amount of war that can be waged by these weapons, stated in quantitative terms. It is defined as the intensity (power) and duration of war that can be waged by operational weapons possessed by combat forces. Military capability is the function of ;

1). The number of operational weapons

2). The power of this weapons (the sum of their capability characteristics).

3). The duration of use of that power,i.e., the maximum number of times that the weapon can be exercised in combat until it no longer can be kept operational. This has strong logistical limitations on the military capability.

But, as we discussed in the comparison of the military forces between ROK and North Korea, The ROK is inferior in the number of weapons and its capability.

(d). Fred Gluck stated that military capability is the product of military logistics system. Then any activity, organization, or agency within the MND which contributes directly or indirectly to the creation and sustaining of military capability is in fact a part of the military logistics system.

(e). In creating any sustaining military capability there is a natural order[40] to the major operations or segments of the military logistics system.

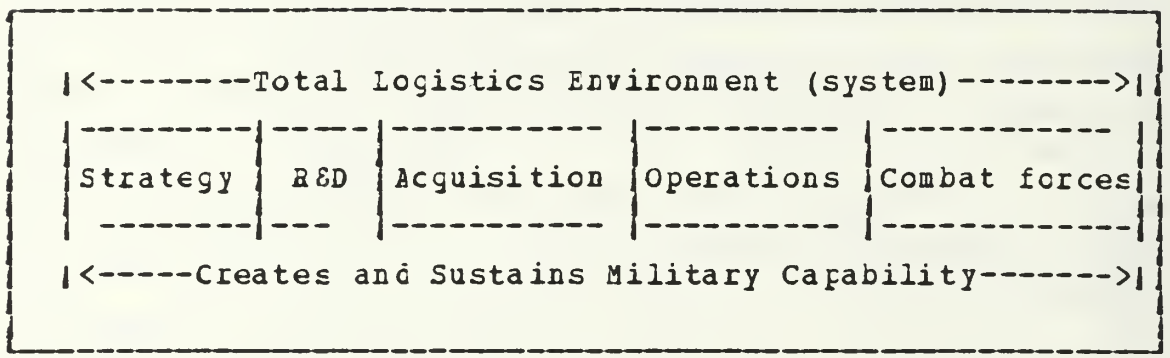

Figure 5.1 Logistics Flow.

To some extent, ROK military forces are superior to North Korea in the field of personnel-oriented logistics, but need some improvement in the weapons-oriented logistics field, especially in R&D, and acquisition. But, the important fact that should be understood is that the personnel- oriented logistics remains as essential ingredients in both the accomplishment of the logistics objective and primary function of the military forces.

(f). Military logistics provides a level of military capability which allows for the implementation of tactical decisions. But, it is important to note that it is also possible for military logistics to restrict the implementation of tactical decisions because of a reduced level of military capability. In other words, the operational planning should be changed according to the increase or decrease in the capability of military logistics.

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[40]Figure 5.1 represents the logistics flow, and it is reproduced from [Ref. 23 pp. 15].

Accomplishing the above content could be done by scheduling special sessions or lectures in The Army Staff College and in The National Defense College of the ROK.

b. A ROK Special Logistics Force

(1) The Necessity of Organizing A Special Logistics Force. It would be worthwhile to examine the necessity and concept of a strategic logistics force suggested by Brigadier General Scott for better logistics strategy of the ROK military forces. He stated the necessity of a strategic logistics force as follow;

> As long as credible nuclear capabilities are in being the U.S. must find ways of competing in the foreign policy area without running the risk of super power to superpower confrontation. If the U.S. is to retain its leadership in the free world, it must not only deter the direct aggression of any world power that has the capability of attacking U.S., it must also provide support for its friends through the world. Such begins with providing allies the necessary weapons and equipment which their armed forces must have to defend themselves. It should not end here, however, it must continue with an effective means of providing sustained logistic support to its friends whenever they attacked by surrogate armed forces of another country. Sustained logistics support means more than weapons, equipment and combat consumeables. It means logistics, trained logistics troops, management, and command control, which only countries with advanced technologies have the capability of providing on short notice [Ref. 20].

ROK should try to maintain and support the weapons and equipment furnished under the provision of the grant aid program by the U.S. government. What is needed in an emergency is both logistics and logistics troops who can move in and take over base-type or wholesale logistics support thereby releasing the able-bodied to fight.

As a historical evidence of the necessity of this kind of strategic logistics command, we can consider the Vietnam War. During the early days of the Vietnam involvement, the U.S. opted to have its soldiers fight the

battle rather than provide for base depot (rear area) logistics support of the RVNAF. This rear area mission, which was referred to by many as "The Enclave Concept" was not adopted by the U.S. Military Assistance Command. The command chose instead the Strategic Hamlet Concept and an active combatant role for the U.S. Armed Forces. With the possible exception of a few unique or emergency situations, the U.S. aid did not provide depot or base type logistics support for the RVNAF during the conflict. All supplies furnished by the U.S. government became the property of the Vietnamese government when off-loaded at the port, in other words, it was theirs to use or abuse. Brigadier General Scott stated that it is unconceivable that the American people will ever again permit the utilization of the U.S. combatant forces in a war wherein there is any alternative short of complete capitulation and surrender of the U.S. [Ref. 20].

Vietnam was asked to shoulder an ever-increasing burden of fighting, using American materials. The Vietnamization program was logistics at its best in direct support of national policy and strategy. Its climax was Project Enhance Plus. Project Enhance Plus was designed to provided the RVNAF with more combat equipment and improved logistics sufficiency. Prior to the project, the U.S. had been providing a logistical support to the South Vietnamese military over an extended period, while at the same time helping fight the battle. Now with the goal of the total withdrawal of U.S. imminent, the Vietnamization process had to be complete and had to be sufficient. There were two problems ; the magnitude of operation, and a tight schedule [Ref. 21].

To avoid this kind of problem in ROK, the ROK should have organized a special logistics force which can operate with the U.S. or allies' logistics troops in case of hostilities in Korean Peninsula.

(2) General Concept of A Special Logistics Force. We can assume that the peace-time logistics support of the U.S. to the ROK will continue, and in case of any hostilities of the North Korea, the ROK may ask for additional help to the U.S. and/or to the allied countries. Upon the request of additional support, the U.S. could provide either combat forces or logistics support troops or both. At the initial stage of the hostilities, the currently existing U.S. ground forces will take part in the war. However, if the ROK military and U.S. ground forces will succeed in blocking the initial hostilities, there is good possibilities that the conflict will continue over some extended period of time. By this time, the President of the U.S. will determine whether or not withdraw the existing U.S. ground forces. If we assume the U.S. withdraw its ground force from Korean Peninsula, even though this withdrawal should not happen, the U.S. may provide only the logistics troops concurrent with some advanced sophisticated weapon systems. Based on this assumption, there should be a military organization that can accept the logistics support and operate the giver systems or equipment by the team which may be composed of the special logistics force of the ROK and the strategic logistics force of the U.S.and/or that of allied countries'. This special logistics force may be the combined organizatior of three military services, i.e., Army, Navy and Marine Corps, and Air Force. This special logistics force could be operated during both peace time and war time.

(3) Detailed Concept of Employment of ROK Special Logistics Force.

(a). The Concept of Operation

The concept of the operation or mission of this special logistics force would be;

1). The members of this special logistics force can work with the U.S. or allied countries' logistic support forces.

2). It can accept the arms transfer from the U.S., if they withdraw their ground forces in peace time or war time.

3). This logistics force must be trained to accept the logistics support of the U.S. and/or allied countries.

4). It could be trained during the combined exercises such as "Team Spirit Exercise", or if the U.S. dispatch any kind of strategic logistics force for exercise, they could be trained at that time.

5). For above operations, the necessary port or ground facilities and the communication network must be established in advance.

6). It could assume the current weapons procurement responsibilities.

7). It should have the ability to request the required equipment and components. For these activities, close monitoring of the logistics status of the combat forces will be required, and must respond quickly to the request of the combat forces.

(b). Organization And Other Considerations

1). It could be one of the units of the Combined Forces Command (CFC), or DPA (Defense Procurement Agency) of ROK.

2). It should be composed of Army, Navy and Marine Corps, and Air Force logistics representatives to support their unique military branch.

3). If there is any similar organization in the U.S., it should have some connection or organization which act as liaison or mediator.

4). To avoid confusion and increase effectiveness, this special logistics force should be combined with, if exist, current organizations which have the similar responsibilities.

5). The active duty members should have the ability to communicate with related foreign logistics troops, in other words, there should be no language problems. Actually, the language training will be required continually, as long as the ROK is recipient of any support.

(c). Expected advantages from a special logistics Force

By adopting this special logistics force, there might be some advantages ;

1). The ROK military could have more combat forces than before adopting this policy.

2). The combat forces could get more effective and efficient war-time logistics support, because it could be done trained personnel and by preplanned schedule.

3). The ROK military forces can fight with the enemy, even if the U.S. ground forces would be withdrawn during the peace time.

c. Acquisition Strategy

When we consider a weapon acquisition strategy, we should think of the life-cycle costing and the acquisition process.

(1) Life-cycle Costing. General Jack J. Catton, USAF, emphasizes the life-cycle costing as a procurement strategy, and also other procurement related documents of the U.S. state the same contents. Historically, when a weapon system approached the active inventory, logistics has two prime responsibilities ;

(a). To support the design which the engineers had produced.

(b). To design the support required in order to do that effectively. Logistics was expected to prepare itself to supply, maintain and modify that system from the time it began its service until its mission completed. Today, as in the past, the day-to-day business of the logistics command is maintenance, supply and modification, i.e., improving its ability to support the operational design through more efficient organization, improved computer capability, refined manufacturing techniques and concepts, and other measures. However, we now have the addition of a third responsibility. National fiscal constraints, which have forced a continuous search to do better, had compelled us to get into design cycle early enough to preclude as many costly logistics problems as possible. This means design for support [Ref. 21]. Experience gained over the past years indicates that 40-60%[41] of the total life-cycle costs for a weapon system can be tied to the basic logistics support elements. If we are going to make economies and efficiencies in our support, we must consider the logistics support impact during the design process. We must induce development engineers in the military services and among defense contractors to give proper weight to

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[41]See [Ref. 21 pp. 10-12].

ultimate support costs. However, the designer is concerned about meeting the operational parameters - how fast, how far, how high. The manufacturer is also concerned with now,i.e., he is reluctant to spend money now to save money in the future. All of these resistance is natural enough, but it can't be permitted to continue. Somebody has to realize that support costs over a life-cycle of a weapon system will have the more important impact on availability of resources to operate, maintain - and most important, to modernize. The one who must keep his eye on future costs is the logistician. The designers, contractors and operations people must keep an open mind to the advantages of life-cycle costing. If we fail to emphasize logistics and life-cycle cost implications, we'll have permitted the purchase of less military strength with the dollars spent [Ref. 21]. For better logistics support, the ROK military should adapt the life-cycle costing method.

(2) Need For Some Change in Acquisition Process. One more consideration is the acquisition process which can help the acquisition strategy formulation. As we discussed in the earlier section, the ROK military forces acquire advanced weapon systems through the FMS program of the U.S. And when we consider the weapon systems acquisition, it will be necessary to to think the impacts of FMS program on the U.S. and ROK industry. General F. Michale Rogers, USAF,stated about the FMS as follows;

> Research and development costs, as well as production and administrative costs associated with FMS, are charged to the purchasing government. In this way, foreign sales are recovering a substantial part of U.S. R & D costs. ... Foreign military sales eliminate gaps in production lines, keep

facilities open, and retain skilled employees. FMS program thereby maintains at least a portion of the national industrial base that could sustained otherwise [Ref. 25].

The FMS program provides the ROK or any allies of the U.S. with the opportunities to prepare and encourage their own defense. However, to some extent, the ROK is helping the U.S. defense related industry which require highly advanced technology, as mentioned by General Rogers. If the ROK continues to accept the FMS program without its own development program, it will lose many things. For example, it will take time to get advanced technology from western countries, and it will be difficult to retain the technicians who get the highly advanced technology from abroad because of lack of related industries. The ROK military should have some development program. The apparent thing is the technicians who get the education from abroad are working in the foreign countries. In some sense, this simple example shows that the ROK has been losing the potentiality of further growth of advanced technology.

Another thing which should be recognized by the ROK is the fact that the FMS program of the U.S. helps the maintenance of the employment levels of the U.S.. [Ref. 25]. Therefore, what is needed for the ROK is that it should apply the FMS program by selective basis. In other words, if any weapon systems or equipment which could be produced with its own potential production facilities, with some R & D work, the ROK should develop them within the country. The acquisition strategy should be changed by careful assessment of many variables such as technology and the industry of the ROK.

For example, if the ROK has advanced technology and industry base to develop a sophisticated weapon system with some assistance of the U.S., it should be

developed by the ROK itself for the long-term point of view. If the ROK does not adopt this acquisition strategy and purchase weapons and military equipment, the defense-related technology may not be developed as rapidly, and the ROK military forces have to purchase necessary weapons and equipments continually from the U.S. and/or from the foreign countries. However, the adoption of this policy needs more detail analysis in terms of costs and other possible disadvantages which are not discussed in this thesis.

Another thing that should be considered carefully by the ROK is the fact that administrative costs other than R & D costs and production costs, associated with FMS are charged to the purchasing government, i.e., the ROK. James E. Schiffman stated in his newspaper article that ;

> U.S. defense contractors fear that a new organization, The Military Mutual Aid Association, set up to aid south Korean military retirees may cost U.S. companies added expense and trouble in selling weapons to Korea [Ref. 26].

If there exist too many middle agencies in procuring weapon systems from foreign countries, the apparent fact is that the procuring costs will increase in the end, because the commissions given to the agencies should be included in the administrative costs of the contractors. Also there might be some advantages to the ROK from this organization, if it will be combined with the existing agencies, if not exist, and operated effectively and efficiently. This may need careful analysis, especially in terms of competitive contracting principles.

In general, what is needed for the ROK is the necessity of change of its military equipment or weapon systems acquisition/procurement process. It could be combined with the special logistics force which is suggested in the previous section.

VI. CONCLUSION AND RECOMMENDATIONS

It is necessary to understand the basic concepts and meaning of logistics and strategy, if we are to properly prepare logistics strategy for business or military fields. Until now, considerable time and effort has been devoted toward the development of strategic and tactical alternatives to increase profit in the business fields and to defend national interests and to win in the battle fields, either in active war or cold war. However, logistics has always been treated as the secondary important fields or in some cases has been totally neglected. Now, it is time to stop considering the strategy and tactics only, either in business or military fields. Rather, much more attention must be placed on logistics to survive in the corporate battle fields and to defend the countries of the free world from the threats of the communist world.

The importance of the military logistics can not be denied in the defense of the Republic of Korea. It is in fact the cornerstone of the military forces, because it provides combat forces with the capability of waging war, it provides the only targible evidence of military power in deterring the threat of the North Korea, it limits and shapes the strategies and tactics that can be implemented during the waging of war, and finally its effectiveness directly impacts the costs and capability of the ROK military forces.

What are needed urgently for the defense of the ROK in current situations are ;

1. The military commanders or planners, especially in high ranking levels of ROKA, ROK Navy and Marine Corps, and ROK Air Force must understand the

importance of logistics to accomplish their missions or objectives. If they don't consider the logistics implications on strategic and tactical planning and performance, it might be a waste of money to invest billions of dollars in acquisition of advanced military equipment or weapon systems. Therefore, they should know logistics in connection with the suggested scenarios in chapter five. All officers should be educated continually about logistics through lectures or any other possible methods in the Army, Navy, and Air Force Staff College, and in the Military Academies of each three services.

2. The ROK should prepare for hostilities with North Korea. In the course of preparing for it, the ROK military must consider the role of the U.S. ground forces positioned in Korean Peninsula in relation to the U.S. defense strategy and historical evidence. Whether or not the U.S. ground forces will fight in another Korean conflict, the ROK military forces must prepare for using the logistical support of the U.S. and/or allied countries effectively. It will be required to prepare for the acceptance of the arms transfer during peace time and/or the acceptance of the logistics support during any unexpected hostilities with North Korea within a short period of time. This means the necessity of new military organization such as a special logistics force which could do the jobs related to the acceptance of the logistics support of the U.S. or allied countries. This consideration should be developed in more detail as soon as possible.

3. The ROK military forces might be equipped by weapon systems through the acquisition and procurement process. As long as the ROK military forces get

weapon systems or military equipment through the acquisition process, it should place an attention on acquisition strategy. The apparent fact is that the operating and maintenance costs of any weapon systems are larger than the initial acquisition costs. This requires the life-cycle costing methods as an acquisition strategy. One more thing that should be taken attention by the ROK military forces is the procurement process of weapon systems from another country or acquire within the ROK. The more the number of the middleman agencies in the procurement process, the more the expense that could be paid. Therefore, it might be cheaper to combine existing organizations which are related to the weapon systems acquisition process into a single entity.

There are many more things that must be considered by the Republic of Korea military forces. However, the above three considerations should be examined in depth by the ROK military commanders or planners. As a result, it might maintain more responsive logistics support during war time and in peace time.

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